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MANUAL TRAINING AND VOCATIONAL EDUCATION

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VOLUME XVII NUMBER 1

MANUAL TRAINING AND VOCATIONAL EDUCATION

SEPTEMBER, 1915.

THE BOY OR THE TRADE AS AN AIM?[1]

IRA S. GRIFFITH.

TWO factors are implied in the topic as stated: (1) the boy, (2) the trade. By the term "boy" we understand the propounder of the question to have reference to the boy as an individual, emphasis being laid upon a development which considers the welfare of the boy as an individual soul rather than a cog necessary for the building up of a highly efficient national social-economic order. By "trade" we understand the questioner to be referring to the placing of emphasis upon subject-matter so strongly that the boy may not be considered as an individual soul with an inherent right to his fullest development, but rather as a member of society to be trained so specifically for a given place in the world's work, whether he wills or not, that chances for his making a change in his life's work are slight. By "aim" we understand the reference to be that of vocational education.

Personally, we should prefer to state the question as "The boy *and* the trade as an aim." As this would preclude any chance for argument in an assembly such as this, it must be evident the program committee desired a discussion upon the relative emphasis which should be placed upon one or the other of the two factors mentioned: the boy as an individual, with subject-matter in the way of trade instruction and experience as secondary, or upon the trade as a thing in itself, by the mastery of which, upon the part of a large number of boys, we shall

[1]Paper read before the Western Drawing and Manual Training Association, Chicago, 1915.

better meet economic demands of an industrial nation or of a nation fast being forced to industrialism.

The question in its general aspects is as old as life itself. It will be found manifesting itself in religion, in government, in education from the earliest recorded events of man's experience even to the present day. It has found its answer at times in the placing of emphasis upon one of the factors, the individual; at other times the individual seems to have had no rights that needed to be respected by society.

Mention needs only be made of a few of the forms thru which the question manifests itself to indicate how the pendulum swings. Among these are the following: The Individual versus Society, Initiative versus Imitation, Discovery versus Authority, Inductive versus Deductive, Psychological versus Logical, Method versus Subject-matter, The General versus the Specific, Culture versus Trade Training, Pure Science versus Applied Science, Theory versus Practice, and so on.

As to the present day attitude toward these things, we like to think we are eclectic—that we are progressing best when we take the best from each and strike a balance. This ideal or idea is nothing new, it may be said in passing; the ideal of the ancient Greeks as expressed by the term "mean" meant just this same balance. It may be remarked, too, in passing, that so long as the Greeks held to and acted according to this ideal their race made progress. Only when the individual was allowed to assume a self sufficiency did the nation succumb to another.

PROPOSITION.

It is proposed here that, as a general statement, the "mean" or "balance" of the ancient Greeks comes more nearly suggesting a satisfactory answer to the question propounded than any extreme.

To this proposition we add the following qualification: There are exceptions to the proposition but they are exceptions which but serve to prove the proposition.

ARGUMENTATION.

What we shall teach is determined by social conditions. This being the case, the subject-matter must always have a large part in the make up of "aims" in educational endeavor. The subject-matter of vocational education is primarily industrial from this point of view. However, when it comes to the question of how we shall teach, we find a determining factor which modifies the emphasis which might otherwise

be placed upon subject-matter. How we shall teach is, according to pedagogical principles, to be determined by the child's nature. This means that attention must be paid to individual needs. It is undoubtedly true that in practical application these factors tend to conflict at times one with the other. This being the case it becomes the teacher's duty to strive as best he can to balance them.

For example, psychologically, education must grow out of the feelings and desires of the boy. If subject-matter is of such a nature that the boy's feelings or desires or interest cannot be enlisted, then the process of education is vain for that boy no matter how logically the subject-matter may be organized or how valuable it may be for him, considered solely from the social-economic standpoint.

On the other hand, desire must develop into efficient reactions, as judged by social-economic standards, just as rapidly as the developing nature of the boy will permit. This means a growing emphasis upon subject-matter.

Reaction in the educational process may come about thru (1) random movement brought about by instinctive tendencies, (2) thru simple unconscious imitation or an imitation involving little thought power, and (3) thru reflective thinking wherein the "why" is an ever important present question.

The first is a necessary stage in every effort at habit formation. However, it is an expensive method and one which may be reduced to a minimum by making use of knoweldge obtained thru race experience. There will always be a sufficient amount of random effort without needlessly encouraging it. One may have all the knowledge necessary about learning to ride a bicycle, but it is only by repeated trials that one learns to ride.

The second type of reaction depends upon a kind of intellectual activity which is a necessary part to the learning process but which has limitations when depended upon exclusively. Learning by or thru mere imitation, with little attention to analysis and reason, may make very efficient machine tenders and automatons, but it cannot make for race progress. Used as a means and not as an end, this type of thinking provides a valuable aid thru which to raise the child from one stage of development to a still higher stage. For example, a boy would have to spend much time to discover thru random experiments all that goes to make a first class carpenter. Thru exercise of the imitative faculty he may rather quickly be brought to an efficient stage of development as to mere execution.

The third type of reaction is the highest—a reaction based upon feeling or desire plus an analysis of situation and a reasoning as to cause and effect. Here the "what" and the "how" of the lower type is an essential part, but the horizon of mere practical expediency as to each specific experience is broadened into one of understanding thru generalized and systematized thinking of the "why." The world has always paid highest tribute to this type of reaction. The laborer in the ditch may be, and is, doing a worthy work and should be suitably rewarded. The world has never paid him as it has paid the engineer who planned the project of which digging the ditch is a part. It is hardly probable that it ever will, this side of the millenium.

Vocational education should provide for all three types of reaction as specified above. Limitations as to time and money available for educational purposes will determine the type of education a boy will be able to secure to a large extent. Mental capacity and natural fitness will enter in as factors.

IMPLICATIONS.

Just so long as wealth is as unevenly distributed as it is, and no greater provisions are made for education of the economically unfortunate, vocational education is doing all it can do for a large number when it provides instruction in the "what" and the "how" in the shortest possible time. There is much work to be done where the employer does not desire a "thinking" individual, and where a boy taught to "think" in the largest sense of the word would be terribly unhappy.

We talk glibly of equality of men, and of the dignity of labor. Facts are that in our heart of hearts we do not and never have considered the unthinking laborer as worthy of the same hire as one who has developed an intelligence which enables him to control his reactions as they affect society with the highest degree of efficiency. I take it that what we do mean is that the laborer of low degree has not received his just share in the distribution of the profits of effort industrially; that there is a moral obligation which the keener intellects have not always observed when they have taken a share which has left the common worker in poverty.

An enthusiastic advocate of vocational education or universal education, of large salary, may assert that he is willing to "get into the trench" and do his share of the world's dirty work. The fact remains that neither he nor any other man of equally keen intellect *is* getting into the trench. The world is not asking him to do so, for it can make better use of his talents, as evidenced by the position and salary it gives

him. No, the problem is not one of making a president of every boy. The problem is one of providing for the free and full development of every boy, not neglecting the less fortunate who must occupy humbler positions as the world classifies them. Not every boy may become a Henry Ford in the industrial world. Let us hope a new day is dawning when, on the other hand, the Henry Fords of industry and commerce will recognize the fact that without the manual dexterity of the men in their factories their ingenuity and creative thinking would amount to but little. Let them reward such dexterity and make it possible for their possessors to live as human beings with something worth while in life for which to live, and there will be less dissatisfaction than now exists.

CONCLUSION.

What has this to do with our question? Just this, there is a place for every type of reaction in the world's work—reaction with little mental effort, reaction requiring somewhat more thought power, and reaction which demands a high degree of intelligence. Each should be provided for in our system of training. Economic conditions and mental capacity will in the main determine the group in which any child will fall until the present social order of things is radically changed.

Extended courses to develop mental grasp and skill? Yes, with all the emphasis upon individual welfare commensurate with his later position as a citizen of our commonwealth. Short unit courses? Yes, courses in which the individual welfare seemingly is sunk in specific industrial demands for a "machine tender" produced in the shortest possible time.

In other words, the emphasis at times may well be shifted from individual welfare to that of industrial demands of the trade, and vice versa, but the best product will be turned out by maintaining a balance between trade or social-economic demands and individual welfare, mentally, morally, and physically.

TO DO A MECHANICAL OR ARTISTIC PIECE OF WORK THOROLY IS MUCH MORE THAN THE MATERIAL OPERATION; IT IS A MORAL ACHIEVEMENT.—Charles W. Elliot.

WHAT THE TEACHER CAN AND SHOULD DO TO PROMOTE INDUSTRIAL EDUCATION

EDGAR S. BARNEY

AT the Hebrew Technical Institute we devote about one-third of the time to academic work in English, mathematics, history, etc., one-third to science and drawing, and one-third to shopwork. We have evidence that our boys make greater progress than boys of corresponding grades in the public elementary and high schools, notwithstanding we devote considerably less time to these academic subjects. The reason is that the boys do real work in the shops under teachers who are skilled mechanics; they grow to feel the necessity of a knowledge of mathematics in their calculations, a knowledge of English to express themselves in writing about their work, and they become interested in the history of the industries and manufactures, as evidenced by the constant use of the school library.

The pattern for the base of a vacuum pump, for example, built by the instrument making class for the physics department was taken up for study. The class was asked how much the brass casting would cost at the current price of 28 cents a pound. No other data or information was furnished. The students were not expected to give the result in three or four minutes, the usual time allotted to an arithmetical problem, but in three or four days. They thought about it, discussed it at the luncheon table and elsewhere, and realized that they must know the relative weights of whitewood, out of which the pattern was made, and brass; and this, some one found out, is "specific gravity." They then asked the physics instructor in the laboratory to let them determine the specific gravity of these materials. They consulted the laboratory reference books as to the method of procedure, and the specific gravities of whitewood and brass were determined and checked. They then weighed the pattern and readily calculated how much the casting would weigh and cost.

The teachers eat their luncheons together, and some of them spoke about the interest of the boys in finding the cost of the brass casting. The teacher of English listened to the conversation and later assigned for a theme, "How We Found Out What the Brass Casting for the Base of the Vacuum Pump Would Cost." The instructor and guide on

inspection trips went to a foundry with the class where they saw men molding and making castings. Again there was a lesson in English in preparing the report for the inspection trip note-books.

Here is an example of real correlation of work—designing and drawing the pump in the first place, pattern-making, machining the parts, physics, mathematics, English, visit to a foundry. And you may be assured that here is real interest, not only in the mechanical work required in the making of the vacuum pump, but in the physics, mathematics, and English as well; and the pump works.

I offer the suggestion that teachers give boys plenty of real practical work, which they can see has a direct relation to life, for when you secure real, genuine interest the difficulties of instruction and discipline are reduced practically to zero.

PARTICIPATION IN REAL WORK

We have 300 boys for a three-years' course, and you may well imagine that scores of such cases as the one just related are coming up constantly. For several years the boys have done a good deal of office work for me, in averaging marks at the end of the term, addressing envelopes, giving out and collecting text-books, helping in the preparation of the manuscript for the annual catalog, etc. We have a Membership Society of 2,200 persons, and an alumni list of over 1,100 names. A class of 25 boys will address sets of envelopes from the card lists, proofread them, insert invitations to the annual meeting, commencement, or other function, seal, stamp, and mail them, all in a part of a day. One of the boys acts as foreman of the job; the principal or his secretary is general superintendent. Envelopes must be proofread, and the cards kept in alphabetical order. All mathematical work must be checked. Text-books must be counted and balanced. This requires system and order, and plenty of time to explain just how it is to be done. A set of rules is kept which is dictated to a class and discussed before the actual work is begun.

Boys like to do such tasks for they are real. And I believe many schools offer such opportunities if teachers would plan them, and not say, "I would rather do it myself."

The teacher in the electrical laboratory requires the boys to keep a complete card file of all the equipment, the closet in which each piece of apparatus is kept, the drawer or other place for every supply or material. The pupils consult this, their own file, when an article is wanted, in-

stead of running to the teacher. We are seldom aware of missing articles or supplies. The boy grows into feeling the confidence placed in him, and the responsibility imposed upon him, and rarely does he fail to rise to our expectations.

While the course of study and work in the departments of our Institute are well established, they are also elastic. We do not build the same thing year after year. Two years ago a large tool-maker's engine lathe was finished, and it is the best lathe in the shop. Another is now under way. Last year two electric motors were made. Speed lathes for the wood-turning shop, metal cutting saws, small dynamos, 2 H.P. gas engines, galvanometers, drill-presses, punching press, automatic screw-machine, surveyor's transit, etc., are among the many things made by students.

When the boys were building the tool-maker's engine lathe, the problem arose as to how to get the heavy bed, weighing over 500 pounds, upon the planer for planing. We could have had the janitor's men lift it up in two minutes; but, instead, the boys spent odd minutes for some time discussing ways and means of raising the casting to the planer bed. They accomplished it by putting a succession of blocks near together under the center of the casting, to act as fulcrums, then rocking it to and fro, each time blocking it a little higher. In this way they soon had it high enough to swing upon the planer, and probably no boy had exerted a force of more than fifty pounds. They had the very best lesson in levers, fulcrums, and handling heavy bodies, and were justly proud of their accomplishment. They went back to their mechanics, mathematics, and English with increased interest.

Only 8% of our boys drop out each year of their own volition, and most of these do so for reasons beyond their control, such as sickness, death in the family, or removal from the city.

If we find a boy not adapted to mechanical work, and not all are, we advise him to try some other work. We are strict in making promotions, yet out of 112 admitted three years ago, we shall graduate 84 this year.

A few minutes ago I stated as my first conviction, that *plenty of well directed, practical work accelerates mental progress.*

The boy is doing his best *thinking* when he is planning things to do. If the problem is not planned correctly, it does not work out correctly.

The steps in education are: doing, oral instruction, learning from books.

My second conviction is that *the constant practice of accurate, truthful, and honest work tends to make truthful and honest men.*

I do not believe you can coax boys to be good to any great extent; they grow into right ways of thinking and acting by doing.

Heredity, environment, and functioning,—which is education—determine a boy's future. The first is beyond the teacher's control, so is the second to a great extent, but the last is the teacher's special business.

In an industrial school, the mechanical drawings and patterns made by the student, machining the various castings to be the parts of an entire motor, dynamo, lathe, vacuum pump, or other finished product, admit of no deception. He cannot look into the back of his book and find the answer to his calculations on the gears he is cutting, neither can he copy from another where each boy, or each pair of boys, is working on a separate part of the whole. He is thinking and performing his tasks along accurate, truthful and honest lines; and such thinking and doing, when extended over a period of years, grow with him and become a part of him.

The records of more than 1100 graduates from the Technical Institute, with rarely an instance of wrong doing or tendency to deceive, is strong evidence upon this subject. Hence, I repeat, that *the constant practice of accurate, truthful, honest work tends to make honest, upright men.*

PROPER BALANCE BETWEEN THE THEORETICAL AND PRACTICAL.

I am convinced that plenty of well-directed, practical work accelerates mental progress. I am convinced also that the best type of school for boys is the one which combines the practical with the theoretical; not so general and theoretical that he misses the practical, and yet not so intensely practical and narrow that he may soon be out of adjustment with the new successive ways of doing things. The practical work and teaching in the science laboratories and the shops must be of such character as to bring out the need of a knowledge of mathematics and of the laws of science; there will then be little difficulty in teaching these subjects.

The simple electrical formula, $I=\frac{E}{R-r}$, shows the boy the necessity of solving simple equations of one unknown quantity. Our teacher of

mathematics, at the right time, takes up this simple case, and others, and consequently has little difficulty in getting the class to understand this particular part of algebra.

Besides, there must be enough of practical shopwork to make real workmen. A smattering, such as is given in most manual training schools is not sufficient. Whether we wish it or not, the fact remains that 90 to 95 per cent of our boys will earn their living by much manual employment in the industries, in agriculture, in transportation; and as processes in the industries are rapidly changing, we should give the boys a training sufficiently broad to enable them readily to adjust themselves to the new ways.

I believe no other school in this country keeps so closely in touch with its graduates. Every year blanks are sent out to them requesting information about their employment, wages, etc. This year, out of a total of 1,121 living graduates, the records of all but 71 were reported. This year this question was asked: "From your experience, what in our course of work, either in the shops or academic departments, have you found most useful to you?" Sixty-one per cent replied that they had found our broad general, yet practical, course of greatest advantage; 31 per cent stated that the work in some particular department was of most advantage to them. We permit the pupils to specialize in some particular department in the third year to the extent of about one-half the time.

I am heartily in favor of private trade schools for the larger industries; continuation schools, part-time schools, cooperative schools; evening schools for men, and even for boys who must work during the day in order to live, but not for others. But it would be impracticable to establish special schools for each and every one of the more than 1,600 different occupations in this state; nor could we be sure that a considerable majority would stay in the locality and at the special work for which they were prepared. And so I repeat that I am convinced that, for most boys, the best type of school is the one which combines with the theoretical much practical work in science and mechanics, with special emphasis on the practical.

EXPENSE AN IMPORTANT CONSIDERATION.

I anticipate some are asking themselves, "How about the expense?" Yes, such schools are more expensive than others because men skilled in their trades, and at the same time having the ability to instruct,

command pay above the average; the classes must be smaller than in the average school; and, besides, there is the cost of supplies.

Our total equipment of site, buildings, machinery, power, heating and lighting plant, has cost about $450 for each of the 300 students now in attendance. The per capita annual cost for salaries, supplies, repairs, etc., is $135. These figures may seem high, but land and buildings in New York are costly, while our salaries average $2000 for skilled men who have been with us long terms of years.

The per capita annual cost of education in the New York City public schools, according to a recent report is:

Elementary Schools	$ 39.
High Schools	102.
Vocational Schools	150.

But such schools combining much practical work with the theoretical need not be confined to large cities as New York, Albany, or Buffalo. Make a beginning, stick to your purpose, and you will grow. But do not try to grow into a college or a degree-conferring institution. Our Institute is for the boy from 13 to 17 years of age and we shall hold to that. We began thirty years ago with 28 students, a few woodworking benches, a half dozen speed lathes, cheap drawing tables, and a few school desks on the top floor of a loft building. For several years the per capita annual cost varied from $83 to $95.

INSPECTION TRIPS.

We have always taken boys to shops and factories on inspection trips; but six years ago we engaged a special teacher for this work, a mechanical engineer, fitted by temperament and disposition, as well as ability, to do it. Every afternoon he conducts a class on some trip, and during the summer he takes out groups of ten boys for two weeks. One of these routes is thru New Jersey into Pennsylvania, and back across southern New York, visiting pottery works, a brick yard, slate quarry, zinc mine, Bethlehem Steel Works, wire factory, etc. The boys travel about 325 miles, of which they walk 200. These trips are for education as well as for pleasure. They cost $25 per boy, including the teacher's salary. Such inspection trips form a very important part of school work.

Every city, large or small, and almost every village, furnishes some opportunity for inspection trips. Glen Falls has its paper mills; Schenectady its electric and its locomotive works; Oneonta its railroad shops; Jamestown its furniture factories.

In a little town out on the Delaware and Hudson Road, where I was born and lived as a boy, there are electric lights supplied by water power. I wonder whether the principal of the high school, or any of the teachers, ever conducted a half dozen boys on a Saturday morning, or an afternoon, up to the dam and electric power house. Here is opportunity, not only for one lesson but for many; the water wheel, pressure of water against the dam, cheapness of water power as compared with steam; sending to the manufacturers for descriptive matter about the dynamo, studying it, making drawings of it, finding out about its magnetic field, whether direct or alternating current, kilowatt and horse-power, the switchboard and its use, number of lamps used in the village and their size, voltage, total amperes consumed, size of wires required, probable cost per kilowatt hour, etc.,—all of which brings in mathematics as well as mechanics. Accompanying this should be the looking up of copper mining, how wire is drawn and insulated, manufacture of steel, what a pattern is, how castings are made. The boys would eagerly buy a pair of bar magnets and a horseshoe magnet of fair size, make some iron filings, get a little titanic acid at the drug store and make prints of magnetic fields. If the teacher is not familiar with this subject, it would be good for him to study with, and ahead of the boys.

From the experience we have had at the Technical Institute I am confident the superintendent of the plant, who must be a fairly intelligent man, would become interested, lend assistance, furnish much information, and possibly would go to the school to give a short talk. All this would create a greater interest in the study of physics, would make mathematics and English easier to teach, would keep the boys busy many a spare hour and would bring them closer to their teacher. Should a question be asked that the teacher cannot answer, he should frankly say so, but add, "we will look it up."

Almost every village of a thousand or fifteen hundred inhabitants furnishes such opportunities. Not all boys will stay in their home towns where they were born; the tendency is toward urban life as shown by the census reports. The development and growth of the factory system during the past forty years is largely responsible for this. Would that it were otherwise and that more boys would go to the farms. But we must take conditions as they are; the industries, and city life, are attracting boys to larger and larger centers. They will be much better prepared to meet these new and strange surroundings if they have had some real practical instruction, and have been taught to do things.

THE TEACHER'S PREPARATION FOR OPPORTUNITY.

The last point I wish to make is that I am convinced that the greatest work lies before the teacher himself.

The public may or may not be ready to endorse and support industrial, technical, and agricultural schools for the young. I believe, however, that the sentiment in favor of them and the willingness to support them is more than keeping pace with the quota of teachers capable of doing their part. Teachers must educate themselves for this new work.

But I hear some one saying, "How can I do this? I am worked to death now. I have twenty hours a week, which with correcting home work, marking examination papers, and preparing the next day's recitation is all that I can do." Oh, no it isn't! Get your older boys to help you correct the home work of the younger ones in mathematics, and to mark certain examination papers, if examinations must be held. You will be surprised to find how much a half dozen boys can do for you, and they will do it honestly and willingly.

Make temporary connection, without pay, with an architect of your town, or with some manufacturing establishment, to learn real drafting and processes of work; with a mowing machine factory, if at Hoosac; with the factory for making cream separators, if at Poughkeepsie. Learn to make real shop drawings, which is the *only* universal language; learn to run a lathe, to mold a pattern, and make a casting; learn why a gasket is used in a boiler, packing in a piston, what a steam engine indicator card is for, and assist in taking one if you can get the opportunity. Find out from the manager, superintendent, or foreman, what a boy should know to succeed in such a place, what kind of problems in mathematics would help him; study the history of the industry itself and the materials used.

If there are no books upon this subject in the library of your town, the state library will send out a small traveling library of 25 books to you. Keep a loose-leaf note-book of the points you gain, using plain unruled paper for your written notes, and faint quadrille ruled paper for sketches and small drawings. All of this requires some energy and determination, but an hour or two a week spent in this way will bring marked results. *This is studying local industries and local conditions in the real practical way.* Then take these lessons and problems back to your boys. Teachers prepared in this way will be in demand for the country needs them.

BEGINNERS IN TRADE SCHOOLS.

By Egbert E. Mac Nary.

ONE of the most troublesome problems by which vocational and trade schools are now confronted is, how beginners in trade training courses should be started. The best possible use of the time must be made in definitely advancing the boy in his acquisition of the trade. It is not a question of what is good work to keep the beginner employed on, but rather what kind of work is best adapted to



FIG. 1. SETTING OUT STOCK. ADVANCED BOY CUTTING ROUGH LENGTHS.

start the boy so as to give him an approach to the trade that involves no waste in time or effort.

The average boy who applies for entrance in the trade school is usually unfamiliar with the processes, is entirely lacking in conceptions of what an accurate job is, and in judgment that is necessary in handling tools. He is impatient to make short cuts to become a machinist, a printer, or a carpenter, etc. He wants to rush the work. His ideas of measurement are crude. His standards of workmanship offer no basis on which to start him.

This green boy is to become a skilled machinist who can turn out work to the degree of accuracy and with that speed that the circumstances of his trade demand. We often hear it said that the boy gets his skill in the trade school, and gets his speed later on in the trade. A trade school run on such a policy may fail utterly in increasing the earning capacity of the boy, for though he may be able to turn out a fine piece of work, he may be so slow as not to be worth 75 cents a day. The trade training school must demonstrate that it does increase the earning capacity of the boys to a point where it pays to take the course. The question of speed cannot be ignored or left altogether to the boy's later experience after he leaves school. The employer looks

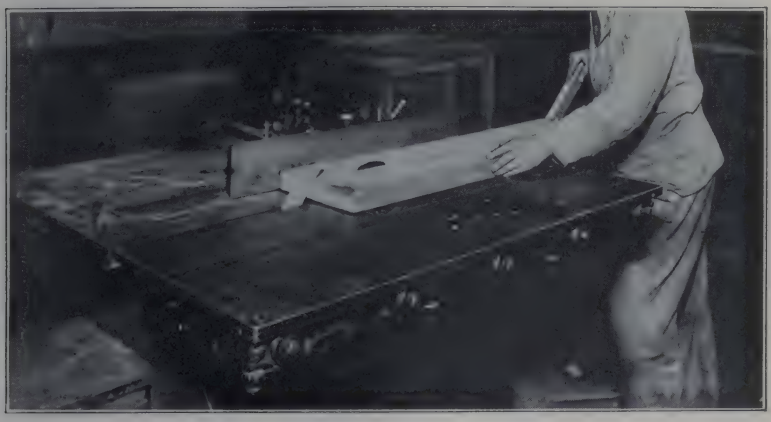


FIG. 2. RIPPING TO ROUGH WIDTHS.

to the trade school for boys who will not putter, but will turn out work in a reasonable time.

If the school is to train boys in the standards of skill and speed, can the boys be employed in any form of work that encourages puttering, or should the work be so planned that the early experience of the boys would be that of turning out work at a reasonable speed? This brings us to the question of whether the boys should be started on jobs requiring hand work or whether they should be given jobs that are more or less automatic, requiring a little or no skill and very little judgment. It is not so largely a question of what particular things are made; it is a question of the methods to be employed in producing those things.

The Springfield Vocational School (Springfield, Mass.) has dealt with this problem in connection with beginners in the machine shop and in the carpentry and cabinet-making shop.

IN THE MACHINE SHOP.

It has been contended that boys should not be put on machines at the first for fear they would damage them, hence they should be given simple pieces to be made on the benches or with speed lathes and that



FIG. 3. TAKING WIND OUT.

after more or less extended experience of this sort, they may be trusted to run machines. If this policy is accepted and the boy is given a series of projects requiring considerable hand work, his progress must be comparatively slow and the standard of work not very high.

It has been found true, however, that jobs may be found that green boys can do on the regular machines without endangering the machines or the boys, and that the boys can turn out this work accurately and quickly. Simple pieces of work may be turned out in quantities and accurately, by the use of jigs and fixtures operated in the suitable machines. The work will be turned out alike if the jigs and fixtures are properly designed; the standard of work will be high and the work will be done with speed.

The question is, which is more efficient as a trade training process to the boy? It is easy to conceive that the jigs can be made and that

the green boy can operate them. The work turned out will be a commercial product, but is the experience of operating the jigs and producing this work in such a fashion, advantageous to the boy in acquiring the trade? To know definitely, one must try the method out in an open-minded fair way. It is not a matter of theory, but of actual practice and it is not material and machines that are being tested, but methods in actual practice upon boys.



FIG. 4. PLANING TO ROUGH THICKNESS BY ADVANCED BOY. BEGINNERS DO NOT RUN MACHINES.

The Springfield Vocational School had formerly held to the practice of giving the beginners in the machine shop some simple pieces of work, such as strap hinges for step ladders, C-clamps, parallel clamps, nailsets, center-punches, etc., each boy making about half a dozen of each. It took considerable time for the boys to make these things, and the standard of work varied considerably. After the boys had completed a series of such products, it was then a question if he had fully acquired the process involved in those pieces. The scheme was not satisfactory as a trade training process. A test was made of having the advanced boys make a set of jigs and fixtures for turning out these same jobs, and the new boys were given from 50 to 100 of some one of these projects to make by this same automatic process. Of course these boys turned out the work quickly and satisfactorily and were ready for more. After giving these boys this experience, a test was made to see what effect, if any, this experience had on the boys' general ability to handle tools. Some of them were given the half dozen projects to make with the hand



FIG. 6. THE PLANING JIG.

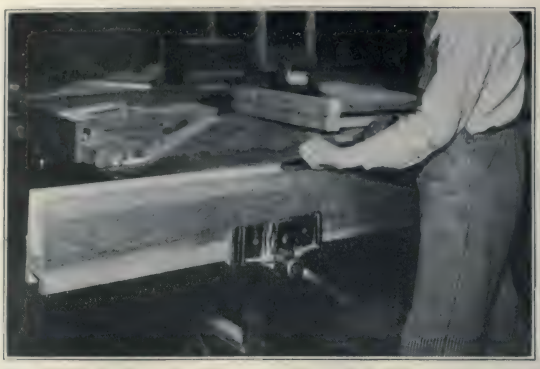


FIG. 5. BEGINNER PLANING RAIL TO WIDTH IN JIG.

A—The Rail

B—Wedges for holding rail in place

C—Stop

E—Two depths in bottom of jig for first and second edges.

H—Track in which plane travels

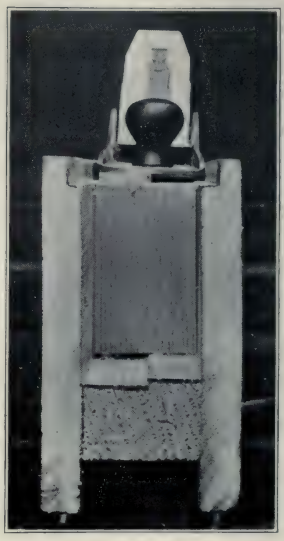


FIG. 7. END VIEW OF PLANING JIG. PLANE RESTING ON RAIL TO BE PLANED.

tools as had formerly been done, and they made them more quickly and better than any boys in the school. As a matter of fact, these boys were better handworkers after having had the jig experience.

A further test was made by taking two boys who had not had the jig experience, but of equal intelligence, and giving them a series of jobs to perform, about six of each, by hand, and later comparing them with the boys who had the jig experience by giving both sets of boys



FIG. 8. CUTTING RAIL TO LENGTH IN JIG.

some new work. Another set of boys was given a large number of pieces of one kind to make by hand, and later these boys were compared with the boys that were started with the jig experience.

Each test demonstrated without doubt that the boys who had started with the jigs and fixtures had an advantage in experience over the other boys. They had a higher standard of workmanship and were not inclined to putter over their work. They could turn out better work and could do it more quickly. The test was so satisfactory, that all boys coming in the second half of that year were started on the jig and fixture basis, and in June the boys who had entered the school in February were as far advanced as the boys who had entered in September when the handwork basis was used to start the year's work. This application of the jigs and fixtures was increased to include such jobs as drilling the jaws and bodies of woodworking vises, making screwdriver handles, bench stops, file handle ferrules, and parts of drawing table standards. The group that was started on the jigs and fixtures

was not brighter nor, as near as could be determined, composed of better workers naturally than other groups. The boys who were formerly started on the handwork basis were carefully shown each step of the process by demonstration, both individually and in small groups, and were given some samples made up of a good standard, but this did

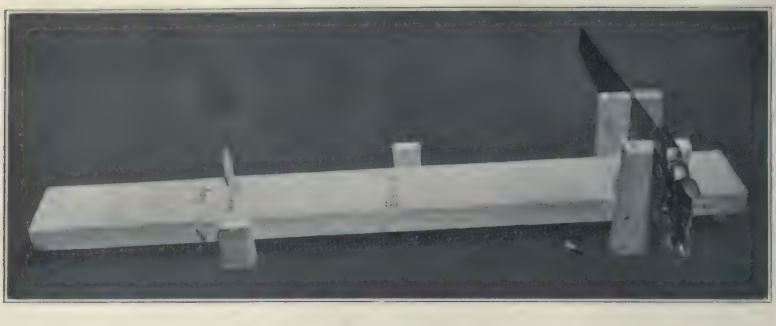


FIG. 9. THE CUTTING-OFF JIG. NOTE MOVABLE PEG AND HOLES FOR ADJUSTING JIG TO CUT LEGS, LONG RAILS AND SHORT RAILS.

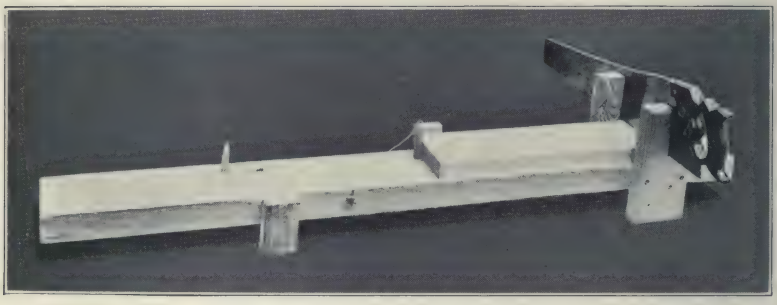


FIG 10. CUTTING-OFF JIG WITH SHORT RAIL IN POSITION.

not seem to give them the necessary apperceptive basis to enable them to turn out work to good standard and with reasonable speed. They had not had sufficient experience to enable them to appreciate the crudeness in their own work. They had not the conception of accuracy; they did not have a realization of how quickly they themselves could turn out the work. On the other hand, the boys who worked with jigs and fixtures necessarily turned out good work and turned it out speedily. They produced a quantity of it, and in this experience did acquire a conception of good standard, and were not afforded any opportunity to work slowly.

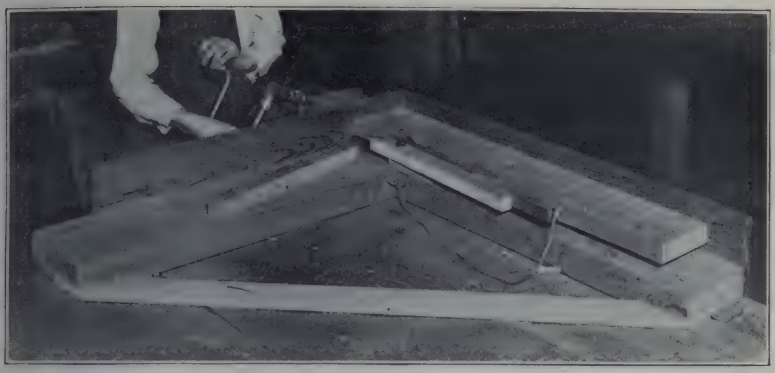


FIG. 11. BOY BORING HOLES FOR DOWELS IN SIDE RAIL. NOTE THE MANNER OF CLAMPING RAIL IN JIG.

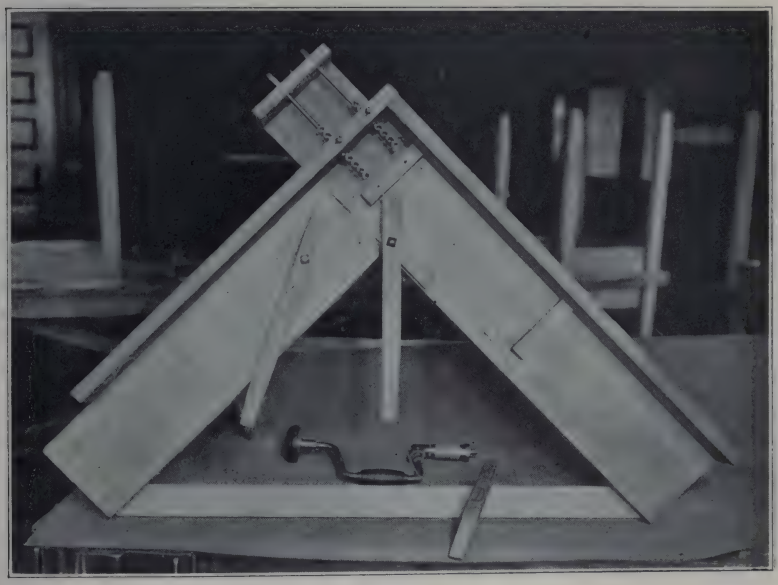


FIG. 12. JIG FOR BORING RAILS AND LEGS.

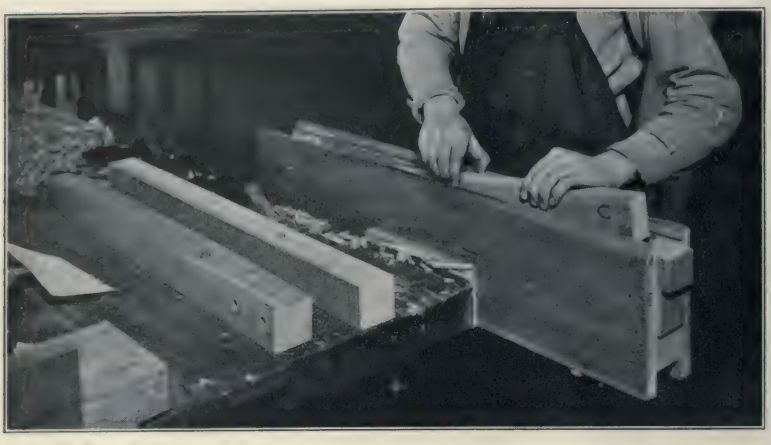


FIG. 13. JIG FOR TAPERING LEGS.
A—Leg to be tapered. B—Tapered leg. C—Leg partly tapered.



FIG. 14. TAPERING LEG IN JIG.

Their apperceptive basis had far more development than that of the boys who had been started on the handwork basis.

Hand skill in the machine trade requires long training and it cannot be hoped that it can be secured at the beginning of the course, but rather at the end of the course. The operative work is simple, can be done successfully by the boy, and gives a reaction to him that contributes



FIG. 15. BORING LEG IN JIG.

a great deal more at the beginning to his acquisition of the trade than the slow and partially successful experience with the hand process. A question of sequence of tools is involved in this problem of starting the boy with the operation of jigs and fixtures. Must he be put on machines in a pre-arranged order, or can he, without any loss on his part, be put on any one of a number of machines irrespective of their order? Experience in the shop shows that there is practically no sequence apparently necessary to be followed in the machine shop trade training. There is a variable sequence in complexity of operations and in degree of accuracy, but the boy can be started in simple operations just as profitably on the milling machine or the shaper or the planer as he could on the lathe or the drill-press. This being the case, considerable range is afforded in planning operations for the new boys so as to keep all of the tools in operation. When the boy has completed a job he does not have to go to a certain machine in order, but can be put on the machine that the instructor chooses for him.

After the boy has had a round of experience of this sort, he can be advanced to using the machines without jigs and he is much better prepared to handle the machines than the boy who has had the bench and speed lathe experience. He has acquired some judgment as to the cutting angle of the tools, the depth of the cut and the speed. He has gotten over his awkwardness in stopping and starting his machine just when he should, knows something about using lubricants and has ac-

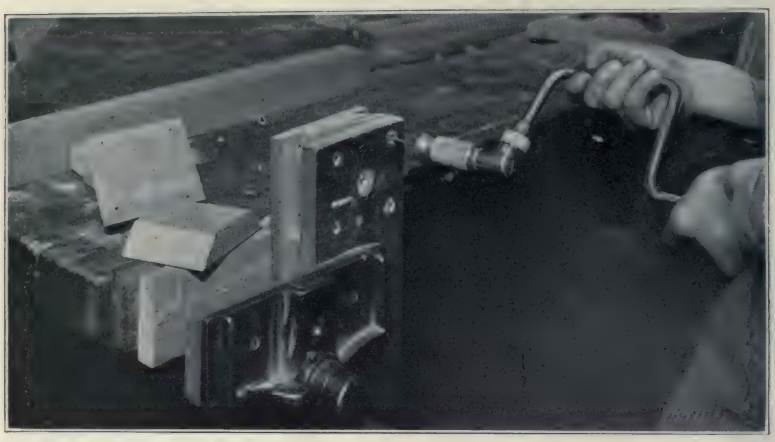


FIG. 16. BORING CORNER BRACES IN JIG.

quired some sense of feeling in feeding the work or the cutting tool. In fact, a step has been taken already in giving the boy increased earning power.

IN THE CARPENTRY AND CABINET MAKING SHOP.

While practically the same difficulties were met in securing satisfactory results with beginners in carpentry and cabinet-making, as in the machine department, the problem appeared for a while to be much more difficult to work out. It was not until the suggestion of using jigs for beginners in the wood trade was tried that any progress seemed to be made.

As a preliminary experience for the cabinet-makers and carpenters, jigs were made for all of the cutting operations in making small drawers,



FIG. 17. ASSEMBLING TABLE FRAMES.



FIG. 18. PUTTING IN CORNER BRACES.

boxes, and tables. In the case of building tables, jigs were made for jointing the tops, sawing rails to length, tapering the legs, boring the dowel holes, and cutting the braces. A sufficient quantity of work was assigned to a boy to make it possible for his muscular senses to be developed while he was operating a jig. The development of the boys' tool skill while they operated the jigs was clearly indicated by the work that was done after the jig experience. A higher standard of

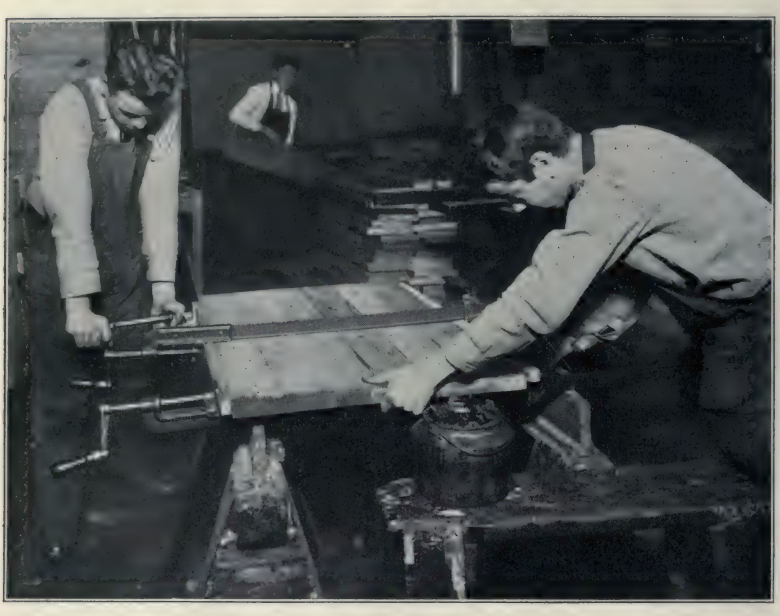


FIG. 19. GLUING TOP.

work has been reached by the boys having had this experience than was the case before this method was tried.

Three factors in trade training were contributed by this experience in operating jigs:

1. The muscular sense in handling tools was developed.
2. A conception of good standard in workmanship was established.
3. An idea of the amount of time a job should take was formed.

The last two factors form the apperceptive basis that is necessary in skilled training. Many a boy's failure in shopwork has been due to a lack of the proper apperceptive basis. To the average boy, a demonstration, or a sample is not sufficient to give the necessary apperception.

It is possible to establish the basis where a boy turns out a quantity of high grade product with mechanical guides as in the case in using jigs.

As to the matter of muscular sense training, when a boy is planing or sawing in a jig, he is compelled to operate the tools as the jigs guide them. This means, if he has a sufficient quantity of work to do, he acquires the habit of handling the tools properly. The results obtained indicate that the boys who have had this experience have gained more



FIG. 20. SCRAPING TOP.

tool skill in the time given to jig work than boys who were started with the usual bench work.

By the jig method, inexperienced boys have produced products in large quantity and of high grade. The effect on the boys of successfully producing first class tables, drawers, etc., has been to give them confidence as well as high standards. When this result has been accomplished, quite a step ahs been taken in the preliminary training for cabinet-makers and carpenters. They are then ready for real trade training.

It should be kept clearly in mind, however, that so far as these wood trades are concerned, the jig experience is preliminary and is used because of its efficiency in giving the boy his start in the trade. In the

machine trade, the use of jigs may be continued for a much longer period. The making of jigs of course offers excellent work for advanced boys, both in the wood and machine trades.

Pre-vocational schools and special classes as well as trade schools may make considerable use of jig operations. Games and toys are turned out by special classes by this method. Furniture and equipment have been supplied to several schools by pre-vocational classes by using jigs. The cost of operating these departments has been considerably reduced by the value of the equipment produced.

Without a doubt, a number of efficient methods may be worked out for starting the boy on his trade toward the desired result. This experiment simply indicates one method.

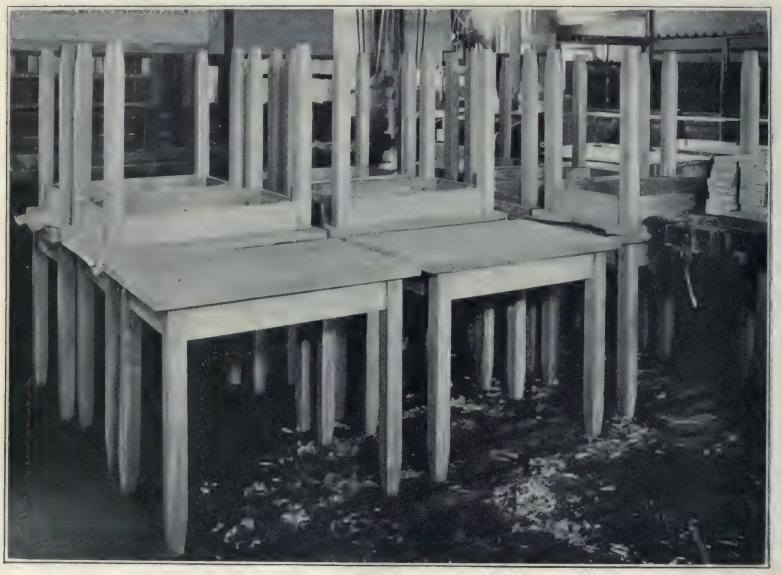


FIG. 21. PART OF THE ORDER.

INTRODUCTORY PROBLEMS IN MACHINE DRAWING—CONTINUED.

J. Calvin Nicholson.

WITH the conclusion of the third plate in the last article,[1] practically all the principles involved in drawing straight-line objects have been applied, excepting the more advanced work found in revolutions, intersections, and developments. But observation seems to show that pupils do not consciously learn principles with much certainty but tend rather to learn concrete cases. It is essential, therefore, that every principle be presented in enough of its varied aspects to make sure that it has been mastered—even though stowed away in the back of the pupil's head almost subconsciously. The foreshortened surface of a wedge, or V block, or house roof even, is naturally of the simplest form of such surfaces to perception. Plate 4 presents some less apparent form of foreshortening. Some repetition also is desirable, since for the great majority of boys, doing a thing only once is perhaps little better than not doing it at all. No deep impression is left and the last trace of a slight one soon disappears. In fact there are not a few boys who will advance faster if required to produce twice the regularly assigned number of drawings thruout the course.

Such a differentiation, however, seriously operates against keeping the class together, and much would seem to be gained if all such boys could be placed in a class to themselves; but such a condition is perhaps rarely attainable in our schools. So here again the best alternative seems to be in a wide range of work. For instance, problem 1 in Plate 4 is comparatively simple, while problem 4 in the same series is quite difficult. Yet experience will show that it is actually easier to get problem 4 done properly by the bright boy than to get problem 1 done even passably well by the dull one. In fact there is little doubt that problem 1 is really too hard for the dullest.[2]

It will be noted that Plate 4 is to occupy the entire 10x14 rectangle. Care is needed here to fix in the student's mind that in the present series the lower left-hand corner of the rectangle always contains the front view regardless as to whether the long dimension of the rectangle is

[1] In the May number.

[2] Acknowledgement is here made of the courtesy of the author of *Babbitt's Working Drawings* for permission to use in this series the second problem in Plate 4. The book referred to has many other problems that are equally good.

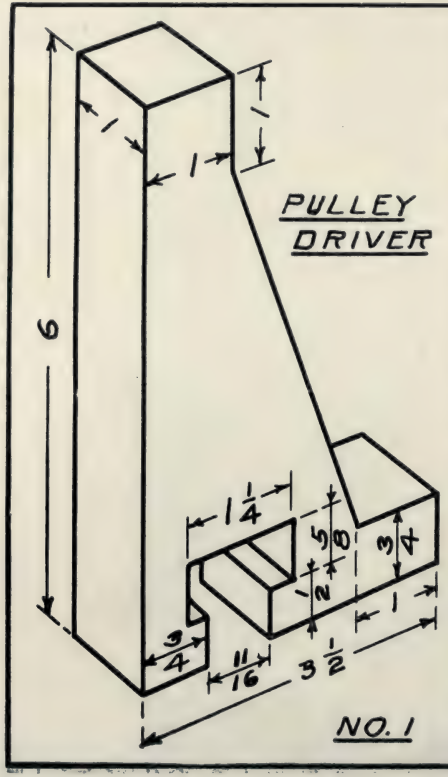
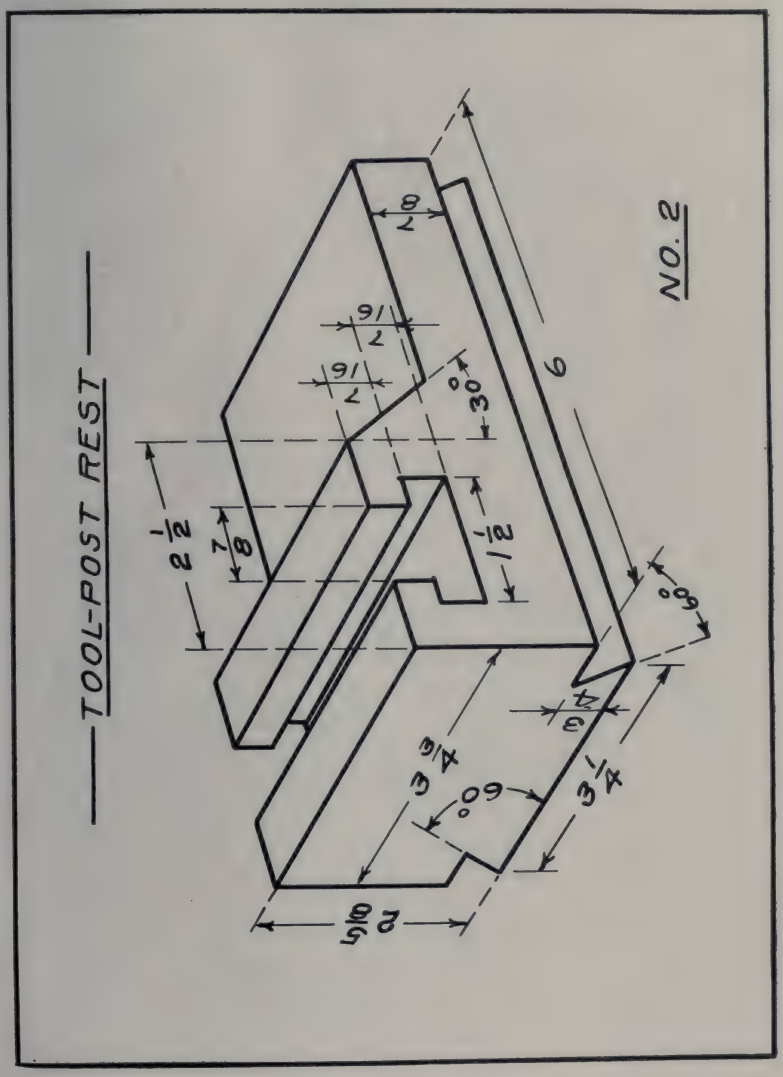
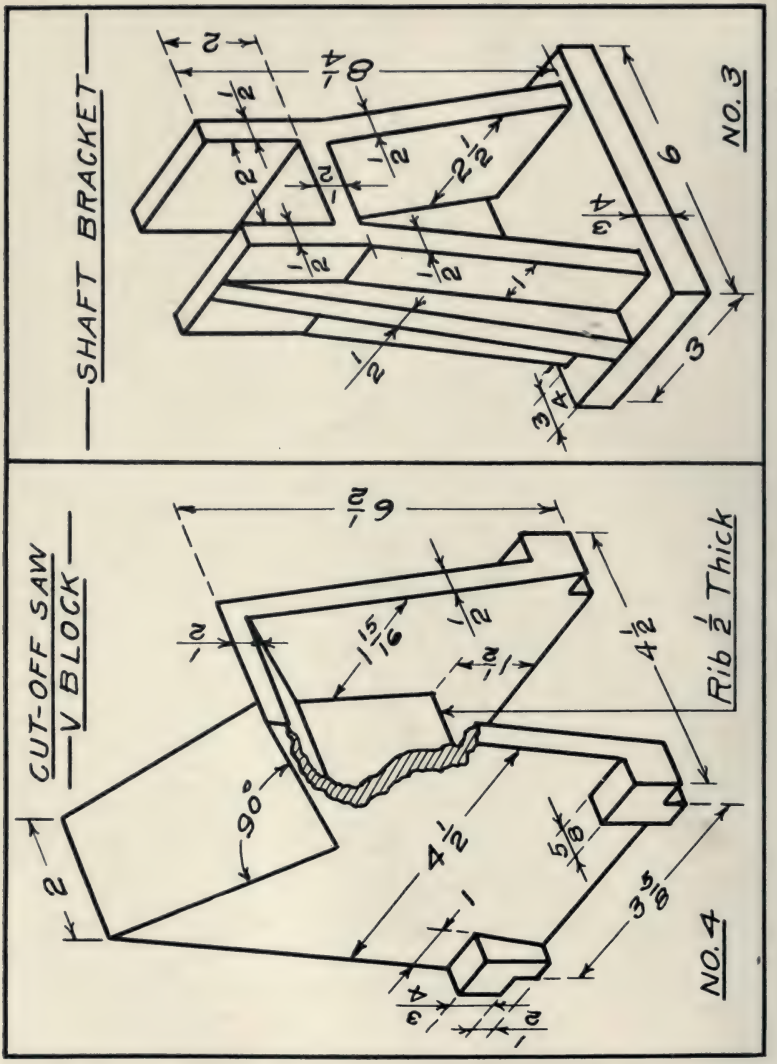


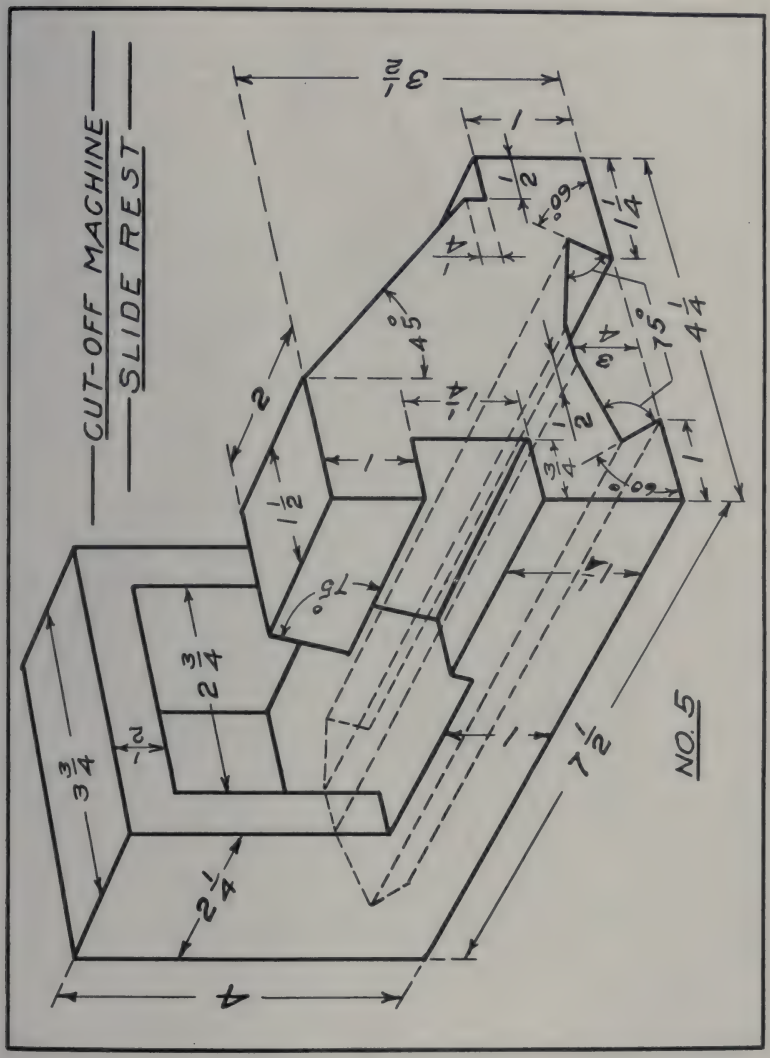
PLATE 4

1. Using the entire 10X14 rectangle of the sheet, draw three views of one of the objects in pencil only. Use great care in pencil work; make all lines distinct but not heavy; erase all run-over lines, and put on dimensions with care neatly.
2. Arrange the title — that is the name of the object — in a roomy space centrally where it will appear well. Print it entirely in capitals only $\frac{1}{8}$ high and set out with lines as shown. Be sure to draw guide lines in pencil for all lettering.
3. Go over all object lines with a pencil and make them a little heavier than the rest.
4. Place a sheet of tracing paper over the drawing and make a tracing in ink.

Note — In putting on tracing paper remove and fasten one corner at a time so as to keep drawing in original position.


TOOL-POST REST
NO. 2
6
7/8
7/16
7/16
30°
2 1/2
7/8
1 1/2
60°
3/4
3/4
3 1/4
60°
3 1/4
2 5/8


SHAFT BRACKET
NO. 3
CUT-OFF SAW
V BLOCK
NO. 4
Rib ½ Thick
90°


CUT-OFF MACHINE
SLIDE REST
NO. 5
3 1/8
1
1/2
.09
1 1/4
4
45°
2
1 1/2
1
1/4
2
3/4
1
3/4
.09
75°
4 1/4
1
75°
2 3/4
1/2
1
3 3/4
2 1/4
7 1/2
4

horizontal or vertical. The lower side, of course, is always parallel to the blade of the T-square when in its proper position. There is a distinct gain for the student by frequently changing the space outline in which a drawing is to be placed, and this is here done as often as occasion allows.

It will be seen that Plate 4 really embraces two plates, the first to be done only in pencil, the second to be traced in ink. The intent here is to offset some of the evil consequences incident to inking all plates. It is hard to get really good pencil work from a class when once it has been discovered that a defect in pencil can be covered up when inking the work later—which, of course, is only a dangerous half-truth. When all other means fail to secure a desired result, there is perhaps no better course to pursue than to make the work of such a nature that it simply cannot be done by any other than the desired procedure. The tracing of Plate 4 is to be made on only moderately thin tracing paper. The drawing in pencil, therefore, simply must be done about right or the tracing becomes a failure. Some boys will heed warning and succeed with the first trial; others have to learn by experience. The sole object, of course, is to get all to learn.

With Plate 4 is begun the use of titles for each drawing. The titles as shown with each problem are fair examples to copy, tho much care is needed to elicit from the boys a real perception of and attack upon the problem of arranging the title so as to add materially to the good appearance of the drawing as a whole. It is hardly in place here to say much about lettering, since that is a subject deserving of broad treatment by itself. Every teacher who has tried it knows how difficult it is to secure even passable lettering for any great length of time. Mr. F. O. Rugg, University of Illinois, has worked out a method that has much to commend it, though it applies rather more, it seems, to vertical than to slant letters and may need some slight modification for use in high schools. Some observations made by the writer suggest that a good deal might be gained if, in addition to mere practice, some aid were provided to enable the pupil to register in the muscles of the hand those movements that make good lettering possible. Tho the following has not been tried out, it may be worth suggesting.

Let the exercises that are to be lettered, be stamped—not printed—on paper suitable to receive a fairly deep impression. Let the first one of these below the copy be stamped so deep that the pen will readily follow the depressed lines of the letters. Let the next line be stamped a little less deep, and so on until the space left for the last line is left

perfectly smooth. There may be mechanical difficulties in producing such a sheet and the student's individuality might be somewhat discouraged, but it would at least insure a right beginning and at that point individuality is more often a hindrance than a help.

(*To be Continued.*)



METALWORK DONE UNDER DOUGLAS DONALDSON IN NORMAL CLASS OF THE SUMMER SCHOOL, MANUAL ARTS HIGH SCHOOL, LOS ANGELES, CALIFORNIA.

TEACHING ELECTRICITY IN A VOCATIONAL SCHOOL.

WALTER B. WEBER.

FROM the time when Benjamin Franklin caught the first electric spark with his kite and key, electricity has had a continuous development which is nothing short of wonderful, and yet we are told that it is still in its infancy. Thomas A. Edison has said, "The chances for big, new electrical inventions are much greater than before the telegraph, the telephone, the electric light and the electric motor were invented, while each of these is far from perfect." There seems to be every reason for believing that the electrician of the future has almost unlimited possibilities before him. For this reason and because the present numerous applications of electricity to modern life call for an ever increasing number of trained workmen, electricity is an important subject of instruction for a vocational school. This fact has already been recognized by school officials in several cities, and courses in electrical work have been established. In this article most of the data given has been taken from the course given under the instruction of the writer at the Seneca Vocational School, one of the public schools of Buffalo, N. Y.



FIG. 1.

NECESSARY EQUIPMENT.

The wiring room, which is used for various kinds of electrical construction work, is 100′x30′. The skeleton rooms inside the wiring room shown in Fig. 1 give the student the best possible practice in doing conduit, molding and knob-and-tube work. Two of these rooms are boarded inside and clapboarded outside, and are used to good advantage for cleat, molding and service conduit jobs. A series of rooms, representing a single flat, are often wired with knob-and-tube work. There are also cross arms on which some line work is done.

The repair shop is 40′x25′, and contains two lathes, two drill-presses, emery-wheel, power hack-saw, and two long benches with heavy vises. In this room all repairing, rewinding and making of new electrical apparatus is done.

The laboratory is 30′x25′. In this room all testing and demonstrating is done. Fig. 2 shows the four panel switch-board which was built by the students. From left to right these panels control the fol-

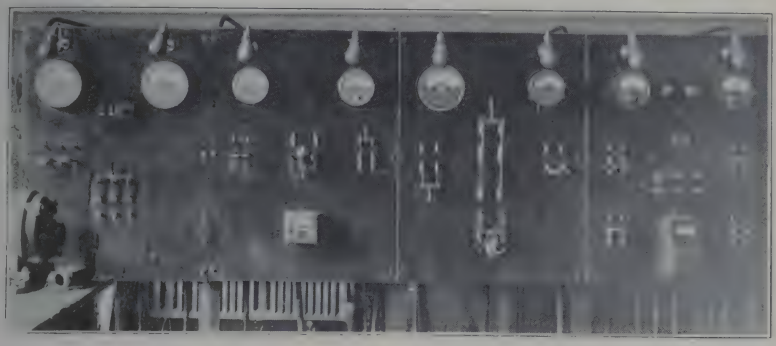


FIG. 2.

lowing currents: 220 volt, 25 cycle, three-phase, for laboratory work (it will be noticed that this panel is not yet completed); 110 volt, single phase, 60 cycle, used for laboratory work and bell ringing transformer for testing in the construction department; 10 volt D. C., used for electro plating; 110 volt D. C., derived from motor generator set, used for laboratory work, steropticon lamp, arc lights and motion picture machine. The laboratory also contains two 110 volt D. C. motors; two 110 volt, 1 k. w. compound wound generators; one 220 volt, three-phase, A. C. motor; one complete X-ray outfit; A. C. and D. C. portable volt and ammeters; various starting boxes; speed regulators, etc.

THE STUDENT.

Embodied in the electrical course is more theory than in any other. For this reason the student must have good reasoning power. It is not a difficult task to find such students, as there is a waiting list for this most popular course.

The student must be fourteen years of age, and have finished the seventh grade to be admitted to the elementary course, which is of two

years duration. In the advanced course the same time is required, but the student must be 16 years of age. In this course he spends all his time in the shop and the drawing room.

During the last three years twenty of the some thirty electrical graduates of the Seneca School are working as helpers and advanced helpers at this trade, at an average of $10.00 per week. Of the remainder, two are working at printing, four at machine work, one is a salesman, two are at high school and three in the country.

ECONOMIC USE OF MATERIAL.

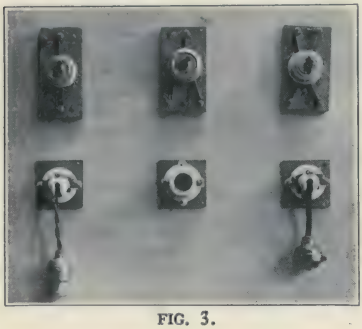


FIG. 3.

In Fig. 3 can be seen a method of mounting switches, receptacles, etc., which reduces the breakage of these fragile articles to a minimum. The snap switches are mounted on $\frac{1}{2}''$ fibre, and the receptacles and rosettes on $\frac{1}{4}''$, before fastening to the board. This work is done by the students and, in order that each year's class get this valuable experience, those articles which survive the term's work are taken apart, and, with the new ones, are mounted by the new class.

Fuses are always giving trouble on the testing lines, unless a lamp bank is used, but this scheme is not a good one as a short circuit does no apparent damage and the student gets careless with the live lines. Therefore, we have installed a circuit breaker at each outlet, so that if the student gets a short circuit his own circuit breaker releases. This he must replace in order to get further current, which naturally leads him to be more careful.

Fig. 4 is a display card made by the advanced students. It illustrates the various ways of making splices and taps with different sizes and kinds of wire. Every joint made by the students must equal these standards and, by so doing, they eliminate all waste of wire due to improper splicing.

PROBLEMS AND METHOD OF INSTRUCTION.

The student spends thirty hours a week in the school, divided as follows: three hours in drawing, the knowledge of which is indispensable

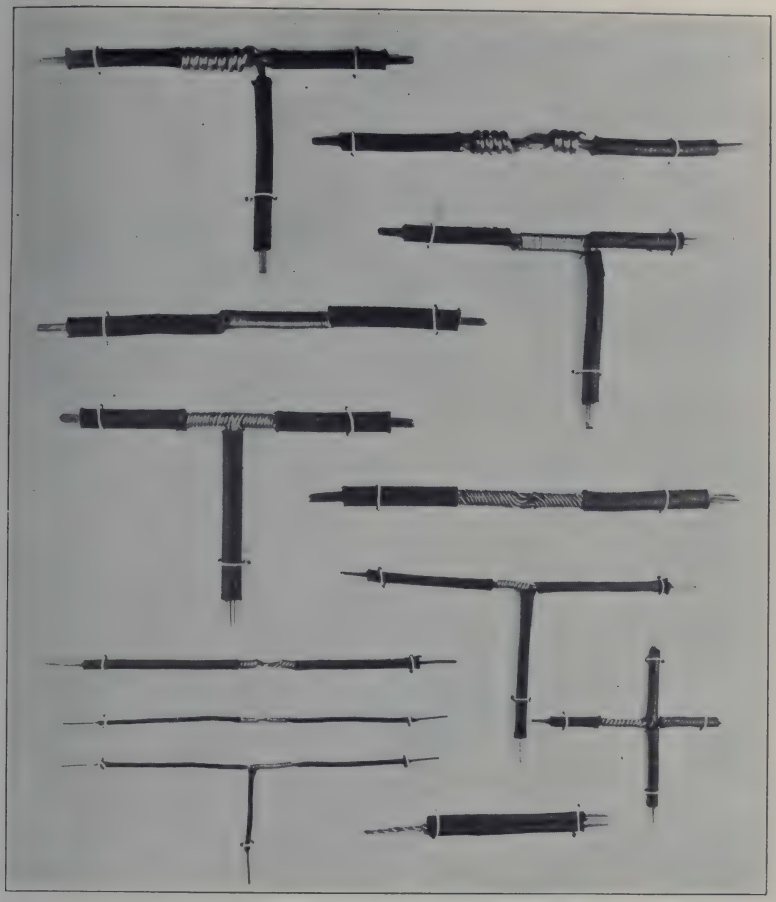


FIG. 4.

to the understanding of electrical drawings, illustrations, blue prints and the construction of electrical apparatus; 13½ hours each in the "book room" and the shop. In the "book room" he gets his correlated academic subjects and keeps a well arranged note-book. In the shop his instructions are varied, extensive and practical, the purpose being to familiarize him with all kinds of wiring conditions, which are given as near commercially as possible.

The problems are graduated in order of difficulty and, in most cases, the new principle involves the preceding one. The usual method of

giving a problem is to put the symbols representing the various articles used on the blackboard and, with the necessary information, the student proceeds to connect the symbols in proper circuit. He is then told to study the drawing and make a mental picture of it, after which it is erased and he proceeds to do the work. After it is finished, the instructor examines it as to neatness, workmanship and in accordance with the fire underwriters' rules.

First, the student learns to make splices and taps, which must be mechanically and electrically secure. He then takes up various battery connections and inside connections and operations of an electric bell. Following these he goes to the panels provided as shown to the right in Fig. 1, and puts up a simple bell circuit, proceeding with multiple, return call, apartment house, elevator, speaking tube, fire and burglar alarm systems, etc., which bring in the various operations of skinning, scraping, splicing, soldering, taping, fastening, etc. He then does some bell work in conduit. At the end of this time he is given a short test with such questions as these:

1. Make a freehand sketch of an electric bell and explain how it operates.
2. Draw a diagram of the wiring for an ordinary two family flat.
3. Draw a diagram of a day and night bell circuit, as used in a doctor's office, using one push button, two bells and a two-point switch.
4. Draw a diagram of the wiring for a six drop mechanical reset annunciator, and show the inside connections of same.

This test, with other records, shows whether or not the student is fit for this class of work. If so, he is allowed to proceed to electric light work, which is handled in the same manner, consisting of knob-and-tube, metal molding, cleat and conduit work, using single-pole, double-pole, three-way, four-way, electrolier, single-pole double-throw, double-pole double-throw and pendent switches, with various combinations controlling lights in receptacles, sockets, etc. In this work, the latest and approved materials are used. All work is done and inspected according to the rules of the fire underwriters.

The second year student starts in the repair shop, where he takes up repair and manufacturing work. Here he gets a knowledge of the operations of machinery, while repairing electrical apparatus, including sockets, rosettes, switches, rheostats, starting boxes, electric bells, push buttons, annunciators, telephones and the rewinding of burnt out armatures and fields.

Fig. 5 shows a student rewinding a burnt out three horse-power, three phase, 220 volt induction motor. This particular type of motor, with

T-shaped slots, has one of the most difficult windings of any machine. The sketch of it may be seen on the blackboard. The student's first step was the making of the drawing, then the making of the form on which the coils were wound; after this they were taped, dipped in insulating varnish and baked. The slots were then insulated and the coils put in, as shown. Fig. 5 also shows an armature of a two horse

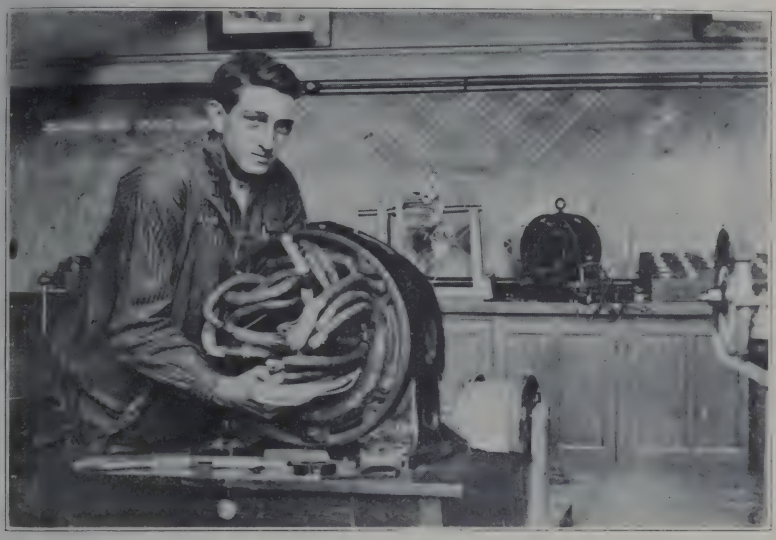


FIG. 5.

power, 110 volt D. C. motor partly wound. This motor is built from the rough castings to the completed machine and the work is mostly done by the advanced class. At various times students are called upon to do small repair work and installations for the school system, thereby reimbursing the city considerably.

The student next goes to the laboratory, where he gets the principles of magnetism, Ohm's law and the telephone clearly explained and demonstrated. He then takes up D. C. motors with various starting devices, D. C. compound wound generators with field rheostat connected singly, in multiple, in series and for the Edison three-wire system; A. C. single phase and three phase motor connections, with starting devices and motor generator sets, with their various calculations, involving variation in speed, field saturation, resistance, voltage, current, horse power and efficiency.

During the two year course, the student spends two weeks in the tool room, familiarizing himself with the various tools and equipment.

To further the work, the students are taken on inspection trips to such places as Niagara Falls power houses, Larkin Co., etc.

SHOP RULES.

1. Be punctual and regular.
2. Pay strict attention to orders.
3. Keep your surroundings clean.
4. Be careful of gasoline.
5. Drive a screw with a screw-driver.
6. Solder and tape all splices.
7. Use all short pieces of wire.
8. Mind your own business.

SAFETY RULES.

1. Do not depend on the insulation of a wire; it may be faulty.
2. All lines should be considered as alive and dangerous, unless they are positively known to be dead.
3. Never leave joints or loose ends of wires untaped.
4. When working overhead, keep tools and material not in use in proper receptacles.
5. Do not throw tools and material to the ground; lower them.
6. Promptly report any broken or unsafe tools or equipment.

TEACHERS QUALIFICATIONS.

The teacher of electrical construction should not only be pedagogically and theoretically trained, but one who has had a thoro, practical experience, and can keep up with the fast development of the new material which is constantly coming on the market. This qualification is very important when we consider how decidedly concrete is the subject-matter which is to be taught. He must also have a knowledge of building construction, machine work, carpentry and pipe fitting.

ELECTRICITY—"CARRIER OF LIGHT AND POWER; DEVOURER OF TIME AND SPACE; BEARER OF HUMAN SPEECH OVER LAND AND SEA; GREATEST SERVANT OF MAN; ITSELF UNKNOWN."

EDITORIAL COMMENT

TWELVE large public schools in New York City will operate under the Gary system during the present school year. If the system works well in these schools it will be extended to others later. It is needless to say that this experiment will be watched with great interest by school men thruout the entire country.

AFTER all the fuss and fight, the Illinois Legislature again refused to pass a vocational education law. There was plenty of organization, overwhelming facts, bill writers and bill menders and volumes of fine oratory, but the law makers found excuse, as they usually do, in the fact that there was no agreement among the advocates of the new law. There was too much display of personal animosity to encourage the conservative representatives of the people to vote the new law. Not one of the three bills introduced was reported out of committee.

SEVEN millions of children in the United States would be glad to go to school in the summer if they were offered vocational subjects —something different from what they get during the regular school year. This is the belief of Professor Allan Whitney, head of the department of education at the University of Michigan. He bases this estimate on figures provided by Commissioner Claxton of the United States Bureau of Education, indicating how many children under fourteen years of age are not allowed to work. These figures do not include those who live in rural districts and work on a farm in summer, but are made up from those who have but little to do but play on the streets and alleys and vacant lots of our towns and cities. Professor Whitney evidently thinks that work is better than play under such conditions.

IN another column we call attention to the movement in New York City toward the adequate decoration of high school buildings. Thru the efforts of Dr. James P. Haney, director of art in high schools, and the cooperation of art societies, school officials and citizens, three of the large high schools of New York are on the way toward being appropriately decorated. This is good news, but why should it still be necessary to develop an interest in this subject? It would seem that the time ought to be at hand when the interior beauty as well as the exterior or more obvious should be considered essential in an adequate school build-

ing. After years of encouraging development in the improvement of school architecture in this country the time ought surely to be near at hand when the contractor's estimate for a new school building will include an amount for decoration sufficient to employ men of high talent to do the work. Surely no building has greater influence upon the lives of the people than the school building. Here it is, then, that mural painting and sculpture can have their greatest educative influence.

THE federal vocational education bill is expected to attract more than usual notice at the next session of Congress. It would seem that enough people are now convinced of the necessity of better provision for vocational training so that the need may now be taken for granted. If this is the case, then the question becomes one of ways and means. How shall vocational training be provided? Shall the city, the state or the nation pay the cost? This question, also, it would seem, has been considered from every angle, and with the conclusion that all three—the nation, the state, the community—should contribute to the cost, because all three benefit, because education is the function of all three. If this is accepted, then we have reached the time when Congress should act. Action on the part of the federal government would be a tremendous stimulus to similar action in the several states, and state action, in turn, would bring about activity in the smaller geographical units.

The National Commission has done its work of investigation; has prepared its bill recommending the expenditure of $7,000,000 annually—$3,000,000 for training in agriculture, $3,000,000 to aid in training for the industries, and $1,000,000 for the training of teachers in vocational subjects. While the bill safe-guards the federal fund it leaves enough of the details of administration to each state to avoid objections because of the differences in state school systems. If this bill, or a similar one is to become a law in the near future it is essential that the school men should stand together in its support. They must keep their eyes on the big thing to be accomplished by the bill and not begin to wrangle over some of the petty details of its application to their own particular states or schools. It would be a misfortune if such wrangling were to cause impatience in Washington and so defeat the bill.

A MOST instructive experiment was conducted during two weeks in July by Indiana State University in the special teachers' training class for women trade workers at Indianapolis. In considering candidates for admission to this class school teachers were rejected, even

teachers of the technical subjects of cooking, millinery, and sewing, with the exception of one or two who had had actual trade experience. Membership in the class, with these exceptions, was limited strictly to those who were employed in the trades, and who gave promise of adaptability to the work of teaching. Aside from these considerations, questions of university credits and entrance requirements were minimized, if not neglected.

The large number of applicants for admission to the course suggests that there is here a large field of work ready for development. It is significant that from the first morning there was an unexpected and unusual readiness to ask questions and to participate freely in the discussion. It was not simply a lecture course. The actual contributions to the discussions exhibited a degree of intelligent interest in the educational and social problems involved, and a measure of ability to profit by the work of such a course, that were quite gratifying.

It is especially interesting to note that this experiment was conducted in an industrial city under the auspices of the school of education of a state university. The assertion has been made so frequently and so vigorously that the public school system of this country cannot and will not deal with such problems that some persons, unfortunately, have permitted themselves to believe it.

As has been pointed out frequently, since trade workers cannot afford to leave their places of employment for long periods in order to study in vocational courses, it is desirable that short unit courses of this kind be planned and brought within their reach. Further details of the Indiana experiment will be awaited with interest.

THE CLEVELAND SURVEY.

CLEVELAND is having what is probably the most thorogoing educational survey that has thus far been undertaken by any city in the country. The movement was inaugurated by the survey committee of the Cleveland Foundation. The purpose of the survey, briefly summarized from the statement of the Director of the Foundation, Allen T. Burns, is to study the school system with a view of suggesting how its efficiency may be increased, to determine the best ways of providing, thru the schools, opportunities for meeting the educational requirements of some of the most common life activities, to acquaint the community with the schools, and to create a strong public opinion in support of an adequate school policy in Cleveland.

In its scope the survey contemplates: a careful study of the schools as they are, in all details of administration, of the subjects taught, their proportionate value and effect upon pupils, the qualifications of teachers and the efficiency of the school organization in giving adequate training; a study of conditions of city life that can be helped by the public schools—occupations and industries and the needs of workers, immigrants and their relation to the community, mental and physical defectives, leisure time and recreation, health, responsibilities of citizenship, etc.

The survey is being conducted by Dr. Leonard P. Ayres, of the Russell Sage Foundation of New York, supported by a large and efficient corps of associates and assistants including many well known educators. Ample financial provision has been made to insure the success of the survey. The public is kept in touch with the work thru reports before a committee of one hundred citizens at frequent noon-day meetings, to which the public is invited and which have been largely attended. Active work was begun in April and will probably not be completed before December. The report will be published in sections, beginning shortly after the completion of the work, reaching over several months.

Cleveland is a fairly representative and normal city of the larger type and in many respects presents conditions favorable to a successful and suggestive report. Educators thruout the country will look forward with interest to the results of this survey.

EXAMINATIONS FOR TEACHERS OF MANUAL TRAINING.

FOR the present and probably for some time to come the special teacher will have to be given a special permit to teach. Somebody—the state commissioner of education, the county superintendent, or the city examination officer will have to select the fit from the unfit in special subjects, and give these official approval.

This practice has both good and bad features. When this selection means that official permits are made a means of holding teachers up to a high standard of practical, personal and pedagogical efficiency, the system works well, but when it means that any school teacher qualified for general school work can get a special certificate to teach manual training by taking a five weeks course in a summer school, or by reading a textbook or two and passing a written examination, it works ill. It makes a farce of certification and does lasting injury to the schools that employ such teachers. If certificates are to be based on examinations,

then the examinations must really examine. In this connection we would point out that no written examination alone can properly test the qualifications of candidates to teach manual arts subjects.

It may be very inconvenient for an examination officer to provide proper equipment and an expert in manual training to give the examination, but this must be done if the examination is to be worth anything. A recent report of a discussion of this subject in Indiana gives as the opinion of at least one schoolman that any person of reasonable intelligence can pass any written examination in manual training by reading a few books on the subject.

We suggest as a solution of this problem that in each state certain institutions training teachers in the special subjects be designated where applicants can go and under proper restrictions be really examined in the technique and subject-matter of the special subjects they wish to teach, and that there be no short cuts around such an examination. The only other way to secure a license should be to present a certificate of graduation from approved courses in approved training schools.

It should never be taken for granted by an examination officer or anyone else that a specialist in school administration is competent to give an examination to prove the competency of a man to teach machine shop work unless, perchance, he is also an expert machinist. Some day we will have to make a united "drive" at this point if the public schools are to become efficient in teaching the manual arts for vocational ends or any other ends that are worth spending public money to attain. In our estimation it is none too early to begin organizing our forces.

AN OFFICE BOYS' TRAINING SCHOOL.

HERE is a successful experiment in vocational training. Ever since last January, Marion Jackson, a young man from Columbia University, has been conducting an office boys' training school at the Boys' Club of Tompkins Square, New York City. In fact, the work has been so successful that the great problem in connection with the work has shifted from trying to get positions for boys, to trying to get boys enough to take the training needed to secure the available positions. The slogan now is "Wanted—Boys to make good in good jobs."

The story of the school is a very direct one. Mr. Jackson was in charge of the employment bureau for boys at the West Side Branch of the Y. M. C. A. Hundreds came to him looking for work. Many

came again and again. He determined to find out why. He soon concluded that the trouble was with the boys. He saw that there was a rather definite technique demanded for an office boy's job, and these boys who were repeaters were untrained and incompetent. So he opened a school at Tompkins Square, and began selecting and organizing the things to be taught—bringing together and developing as subject-matter the principal elements of an office boy's work. Here are some of the topics in his outline.

I. Personal:—(a) Cleanliness first and always, (b) courtesy, (c) "pep", (d) make yourself useful.

II. Business:—(a) how to fold letters—stamping, sealing, mailing, (b) how to wrap parcels, (c) parcel post rates, (d) how to run errands with economy of time and strength, (e) study of street car system and local geography, (f) how to send a telegram, (g) how to read a railroad time table, (h) how to make a bank deposit, (i) how to file letters, (j) how to use a type-writer, (k) how to manipulate a telephone switch board, (l) how to treat people over the telephone wire, etc. etc.

All of these are much more important than might at first appear, for it is skill in such as these that make the boy who is wanted—that enable a boy to hold a good job. How many of the above items could be taught in the public schools of your city without making the school work less vital as general education? How many of these would add to the interest of school experience? In a large business house do you suppose it would do any harm to have the people "higher up" able to fill the office boy's job? Which items in the above list are needed in the jobs higher up?

Let us remember that vocational training does not condemn a boy to one job for the rest of his life, and (b) that vocational training and general training may have more points in common that we sometimes think.

OF CURRENT INTEREST

ACTIVITY RESULTING FROM THE NEW LAW IN PENNSYLVANIA.

ON the 13th of May, Martin G. Brumbaugh, the schoolmaster governor of Pennsylvania approved a comprehensive law providing for the "health, safety and welfare of minors." This law prohibits the employment of children under fourteen years in any establishment and in any occupation except farming and domestic service in private homes. It prohibits the employment of minors between fourteen and sixteen years of age unless they attend school an equivalent to not less than eight hours a week, and this school must be such as will receive the approval of the state superintendent of public instruction. The school, however, may be conducted in "the establishment where said minor is employed" or in a public school building or in such other place as the board of school directors of the district may designate. But this school must be "part of the public school system;" and it cannot be on Saturday; it cannot be before eight o'clock in the morning or after five o'clock in the afternoon. No child under sixteen years of age is allowed to work more than fifty-one hours a week or more than nine hours a day. He must not work before six o'clock in the morning or after eight o'clock in the evening.

This law, which goes into effect January 1, 1916, has been the cause of some unusual activity during the summer. In order to make possible for the school districts thruout the state to carry out the provisions of the new law the State Department of Public Instruction, thru Millard B. King, head of its vocational bureau, very hurriedly orgainzed five centers for summer instruction for prospective continuation school teachers. The purpose has been to give to selected groups of public school teachers a point of view for continuation school work and some material which may become the basis of their classroom activities.

One of the centers for such work was the Philadelphia Trades School, of which William C. Ash is principal. During the past four years this school has been carrying on, as a part of the day trade school work, preparatory classes in which was presented subject-matter selected from the seventh and eighth grade work, with the purpose of bringing the boys up to the point where they could begin the regular secondary training of the school on a par with boys who had been promoted from the eighth grade. Moreover, for two years the school has been con-

ducting continuation classes in printing and sheet-metal work organized under a voluntary arrangement with the employees in the two grades. By combining the experience gained in the preparatory classes and the continuation classes in these two trades, the Trade School is enabled to make tentative plans for the work under the new law and to be of great help to prospective teachers. The subjects presented to the classes of teachers this summer were English, mathematics, civics, geography, hygiene and drawing. Over 200 applications for instruction were received in this center alone, from which 94 were selected and divided into three groups. The teachers of these classes were Trade School instructors. Their method was to (1) discuss the purpose of the particular subject in hand, (2) present a lesson, (3) further discussion, (4) have a pupil teacher take charge of the class, conducting it as tho it were a continuation class. Emphasis was placed on giving the class the new point of view, necessitating the development of new material and new methods of teaching. As a further means of giving the new point of view, the class made trips to various industrial establishments and to residential sections of the city so that future teachers of continuation school work may have in mind both the industrial and the home conditions of their pupils.

The other centers for this teacher training work were the Poplar Street Industrial School, Reading, under Wallace E. Hackett; the Technical High School, Scranton; the High School, Altoona; the North Industrial School, Pittsburgh; and the Academy Industrial School at Erie.

Thus is the state of Pennsylvania preparing for a new era in public instruction.

TRAINING WOMEN TRADE WORKERS TO BECOME TEACHERS.

For the first time in the history of vocational education in this country, so far as our observation goes, a state university has offered a course for the training of teachers of the trades open only to women workers in the trades. For two weeks beginning July 5, 1915, Indiana State University, Bloomington, thru its department of industrial education, offered a special teachers' training course for women cooks, milliners, and dressmakers. In response to published announcements ninety women applied for admission to the course, which fact in itself seems significant. Of these applicants, eighteen were selected after careful inquiry and considerable correspondence.

The course was not given on the university campus, but in Indianapolis in order to place the opportunity within the reach of as large a

group of trade workers as possible. Thru the courtesy of the Indianapolis public schools the necessary rooms and equipment were made available at the Shortridge High School.

The class met for a three-hours session daily, five days per week for the two weeks. The work included a limited amount of attention to practical activities for the purpose of illustrating examples of methods of dealing with materials and processes in the three trades; methods of organizing and presenting teaching material; methods of handling administrative details; demonstration lessons, criticism, and discussion.

This course is a part of the general program for vocational education now being developed by Professor Robert J. Leonard, head of the department of industrial education, of the university faculty. Miss Cleo Murtland, assistant secretary of the National Society for the Promotion of Industrial Education, was in charge of the class and organized the details of the work. In order to give this time to Indiana Miss Murtland secured leave of absence from Minneapolis, where she is engaged for the summer on the work of the vocational education survey. Professor Leonard's plan for the two-weeks' institute in Indianapolis provided for a similar class for men workers from the trades, which had to be abandoned at the last moment because of the sudden illness of the instructor.

THE GARY SYSTEM STARTED IN TROY.

Last year the city of Troy, N. Y., went thru an experience that scores a point for the Gary system of organizing schools. Troy had built and equipped a new central school for vocational education and for use as a community center.

Besides the usual carpentry and cabinet making, sheet-metal and foundry shops, the building was provided with applied science rooms, chemical, biological and physics laboratories, a domestic science department, a very large gymnasium and an auditorium. The cost of the school and equipment was close to half a million dollars. The plant was excellent, but was proving to be very expensive to maintain in a city of 80,000 inhabitants, when a fire destroyed one of the largest grammar school buildings in the city, thus throwing upon the school officials the problem of providing at once for 560 children. Superintendent Eldred thought at once of the Gary system and sent a telegram to Superintendent Wirt asking him to come to Troy and help him. Mr. Wirt responded at once, and found plenty of rooms in the central vocational

school, not only for the 800 children already there and the nearly 600 from the building destroyed by fire, but also for any increase which is likely to come during the next five years. Under the new system it is stated that the school can accommodate from 1800 to 2000 children, giving them the full program of work, study and play.

PREVOCATIONAL CENTERS IN BOSTON.

The prevocational work in Boston under the direction of John C. Brodhead has already become an important part of the public school system and is becoming more so every year. These centers offer special advantages (a) to boys who return to school from work, (b) to overgrown boys, (c) to academically retarded boys, (d) to motor-minded boys twelve years of age or older who have reached the academic requirement of one year in the fourth grade, and (e) to any other boys who are not likely to graduate from the grammar grades before reaching the age of fifteen years. These centers are helping to prolong school life, to awaken desires for careers in the industries instead of as messengers or laborers, and in many cases to stimulate boys to go on to one of the high schools of Boston. Each center has from one to three classes. Each class consists of a maximum of forty-five pupils, fifteen of whom are in the shop, fifteen reciting, and fifteen studying at any given time during the six-hour day. No home study is required. Last year there were eight centers with thirteen classes, each with an instructor of shopwork and an academic teacher. The location of each center and the type of shopwork in each class is indicated in the following list:

I. Austin Center, East Boston. Three Classes: Bookbinding, Machine Shop Practice, Printing.

II. Quincy Center. One Class: Machine Shop Practice.

III. North Bennet St. Center. One Class: Printing, Woodworking and Concrete Work.

IV. Sherwin Center, Roxbury. One Class: Sheet Metal Work.

V. Lewis Center, Roxbury. One Class: Printing.

VI. Winthrop St. Center, Roxbury. Two Classes: Bookbinding, Woodworking.

VII. Agassiz Center, Jamaica Plain. One Class: Box Making and Woodworking.

VIII. Lyceum Hall Center, Dorchester. Three Classes: Electrical Work, Sheet Metal Work and Woodwork.

This year three new centers have been added as follows:

IX. Parkman School Center, South Boston. Three Classes: Machine Shop Practice, Cabinet Making, Electricity.

X. Abram E. Cutter School Center, Charlestown. Two Classes: Cabinet Making and Electricity.

XI. Miles Standish School Center, Roxbury. Three Classes: Machine Shop Practice, Electricity and Printing and Lettering.

The equipment for these new centers costs from $2,000 to $3,000 each. The material product of the centers is of a commercial character, being based on orders for general school purposes, and each center is credited with the value of the goods produced.

The academic work of each class is closely correlated with and based on its shopwork and upon trips frequently taken to bonded warehouses, factories, steamships, expositions and illustrated lectures. Much use is made of catalogs, time-tables and trade journals. The subjects are arithmetic, drawing, geography, history, hygiene, reading, and spoken and written English.

MANUAL ARTS DEVELOPMENT IN UTICA, NEW YORK.

In reviewing the work of the manual arts department of the public schools of Utica, N. Y., the supervisor, Charles B. Bradley, has pointed to the following interesting facts:

Art education in the grades has been reorganized and is under the supervision of two trained supervisors; one has the primary drawing and handwork, and the other the intermediate and advanced drawing.

Woodwork, cooking and sewing are taught in grades four to eight inclusive. Seven centers for this work are now in use, and another will be soon ready.

Four years ago a vocational school for seventh and eighth grade boys and girls was opened with three teachers and forty-three pupils. Last year this school had an enrollment of 192, with eight teachers beside the principal. Woodworking, sheet-metal, electric wiring, plumbing, mechanical drawing, cooking, laundry work, sewing and millinery are taught beside the book work which occupies one-half the six-hour day.

The school has served to awaken a keen interest in the advantages and possibilities of industrial education and has brought about a desire for enlarged high school opportunities in the community. The vocational school building is being remodeled to provide enlarged and improved facilities for the work. It is planned to add machine shop and printing work in the future.

Construction work has been started on an addition to the high school which is to include shops, laboratories and classrooms for vocational work for both sexes. The building is to cost $450,000 exclusive of the equip-

ment, and when completed, with the present building, will be one of the largest high schools in the state. Provision is being made for the following departments: commercial, household arts, mechanical and free-hand drawing, wood working, textile manufacturing, forge, foundry and machine shop, plumbing, sheet-metal, pottery, electric wiring, and printing.

THE MINNEAPOLIS VOCATIONAL EDUCATION SURVEY.

By the will of the late William Hood Dunwoody of Minneapolis, a trust fund of more than three million dollars was created for the purpose of giving free instruction in the industrial and mechanical arts to the youth of Minneapolis, and the State of Minnesota. Before undertaking to put into effect the provisions of the will in any comprehensive way, the trustees of the fund desired complete information as to the kind of vocational education most needed by the city, and advice as to the best ways in which the school could cooperate with the other educational agencies and institutions of the city and State. Various recent events and local conditions led directly to the present survey for which this gift furnished the necessary funds to meet a part at least of the expense for industrial education, and made necessary a study which should define the activities of the public schools and of the Dunwoody Institute.

The superintendent of schools, together with the board of education, and the trustees of the Dunwoody Institute secured the cooperation of various local agencies in bringing the National Society for the Promotion of Industrial Education to Minneapolis to make this survey and hold its annual convention.

Many different agencies are cooperating with the National Society in making the survey. The expense, which will be about eight thousand dollars, is being met by the board of education, the William Hood Dunwoody Institute, the University of Minnesota, and the Woman's Club. In various ways, service whose total value is not less than an additional eight thousand dollars is being contributed without cost, by the board of education, the Dunwoody Institute, the University of Minnesota, the Minnesota Department of Labor, and the Minneapolis Public Library. Business men, social workers, workingmen, and educators are giving freely of their time and their knowledge. Especially valuable have been the contributions of employers and employes, meeting in trade conferences to talk over the content and detail of their common interests.

The survey follows, in general, two lines:—First, an investigation of public and private schools, in order to ascertain what vocational training is already being given, and how effectively it is meeting the needs of the pupils; Second, an investigation of a number of selected industries for men in which the major portion of the working population is employed, and certain industries for women, in order to ascertain the teachable content of these industries and how best that could be taught.

The survey undertook the investigation of the following industries: building trades, metal trades, wood trades, printing trades, flour milling, baking, department stores, laundries, garment trades, dressmaking, millinery, and knitting mills. In addition, investigations were undertaken of the possibilities of training for home workers, of home gardening projects, of the place of art in industry, and of the non-commissioned officers in industry. The investigation of the building and printing trades was accomplished, in the main, thru a series of conferences at which representatives of employers and employes were present. These resulted in the formation of a series of trade agreements between the trades, the public schools, and Dunwoody Institute, by which boys are guaranteed two years of training in school, and a third year of experience in the trade, after which time, they are granted a diploma.

The following unions have passed such trade agreements: Bricklayers', Machinists', Painters', Plasterers', Plumbers', and Steamfitters'. The Master Plumbers', Printers', Steamfitters', and Builders' Associations have adopted the agreement also, and it is in the process of adoption by other employers' associations. A similar trade agreement was drawn up for department stores, garment makers, and laundries. This has been adopted by the Minneapolis Retailers' Association for department stores.

The field survey for the following investigations is now practically complete: building trades, flour mills, department stores, laundries, garment trades, millinery, art in industry, and home gardening. The remaining investigations will be completed and the first draft of the complete findings of the survey will be finished by November first, at which time they will be submitted to the General Survey Committee of the National Society, for approval as a report to the convention of the Society which is to be held in Minneapolis in January.

SECOND PAN-AMERICAN SCIENTIFIC CONGRESS.

In accordance with the resolutions of the First Pan-American Scientific Congress, held in Santiago, Chile, December 25, 1908, to

January 5, 1909, a Second Pan-American Scientific Congress will meet in Washington, D. C., December 27, 1915, to January 8, 1916, under the auspices of the Government of the United States. Hon. William Phillips, Third Assistant Secretary of State, is chairman of the executive committee in charge of the arrangements for the Congress. Membership in the Congress includes:—(1) Official delegates of the countries represented; (2) Representatives of the universities, institutes, societies, and scientific bodies of the countries represented; (3) Such persons in the countries participating in the Congress as may be invited by the executive committee, with the approval of the countries represented.

The Congress will be divided into the following sections:—I. Authropology; II. Astronomy, Meteorology, and Seismology; III. Conservation of Natural Resources, Agriculture, Irrigation, and Forestry; IV. Education; V. Engineering; VI. International Law, Public Law, and Jurisprudence; VII. Mining and Metallurgy, Economic Geology, and Applied Chemistry; VIII. Public Health and Medical Science; IX. Transportation, Commerce, Finance, and Taxation.

Section IV, Education, is to be made up of several sub-sections, including one on "Industrial Education." This sub-section will devote two and one-half days, December 30 to January 1, to a strong program dealing with the general topic, "Education in the Trades and Industries." The chairman of the sub-section is Dr. William T. Bawden, specialist in industrial education, U. S. Bureau of Education. Associated with him as members of the sub-section Committee on Industrial Education are Hon. David Snedden, Commissioner of Education, State Board of Education, Boston, Mass.; Dr. Charles A. Prosser, secretary, National Society for the Promotion of Industrial Education, New York City, and Professor Charles A. Bennett, Bradley Polytechnic Institute, Peoria, Ill.

COURSES FOR MANUAL ARTS TEACHERS AT THE UNIVERSITY OF MINNESOTA.

With the opening of the school year important new courses are to be offered in the college of education at the University of Minnesota, under the direction of Dr. Lotus D. Coffman, recently appointed dean. Several new courses will deal with the general field of educational administration, for both undergraduate and graduate students. There will also be several new courses in educational psychology. For this

work another member is to be added to the staff. Announcement has not yet been made of this appointment.

A course for the preparation of teachers for rural schools will be undertaken by Miss Mabel Carney, supervisor of the teacher training department in the state department of education.

A course for prospective teachers of the manual arts will be given, for the first time in the regular school year, by Ray L. Southworth of the Minneapolis public schools, who conducted a very successful course during the summer session of 1915. The course is planned with special reference to the requirements of those who are to be supervisors of manual training, teachers of drawing and shopwork in the grades and high school, teachers of manual training and agriculture, and teachers of manual training and other special subjects in combination. In order that those who complete this work may have a thoro educational foundation, the course is intended primarily for those who rank as juniors and seniors in the college of education. Students having the appropriate qualifications will be permitted to elect manual training as a major subject.

The courses offered include: constructive drawing, mechanical drawing, elementary and advanced woodworking, wood-turning and pattern-making, forging, clay and cement construction, foundry, machine-shop practice, methods and organization of manual training, and observation and practice teaching.

Mr. Southworth, who, with the assistance of other members of the staff, will have the direction of these courses, has had excellent preparation and experience for the work. After two years' work in engineering at the University of Wisconsin, he went to Teachers College, Columbia University, where in 1903 he completed the work for the B. S. degree in manual training for secondary schools. Since September, 1903, he has been connected with the Minneapolis public schools, in positions which have given him experience in every type of manual arts work in the grades and high school, as well as evening school work. His present position, held since 1908, is instructor in mechanical, machine and architectural drafting in the new West High School. Mr. Southworth is well known to readers of this Magazine as a contributor, and for his activities in the Minneapolis Manual Arts Club and other professional organizations. He was a member of the party of twenty-four American teachers who spent some time in Germany in the spring of 1914 studying industrial education under the auspices of the U. S. Bureau of Education.

The addition of Minnesota to the ranks of state universities offering special courses for the preparation of manual arts teachers, while not unexpected, is one of the important events of the current year.

PROBLEMS OF EDUCATION FOR WOMEN.

In her pioneer work at Teachers College Mrs. Mary Schenck Woolman was one of the first to recognize clearly that public school work in the domestic arts must in some way make vital connections with industry as well as with actual conditions in the home. The organization of the Manhattan Trade School was thus primarily for the purpose of providing a laboratory in which teachers might be trained in the practical application of their work and in appreciation of trade conditions. During the period of cooperation between the two institutions it was possible for Teachers College to train two types of teachers.

Then came the opportunity to develop a plan for coordinating the courses offered at Simmons College with the practical shop departments of the Woman's Educational and Industrial Union. By the time this organization was completed it became evident to Mrs. Woolman that some one must make a study, more thoro and comprehensive than has yet been made, of conditions and problems in the entire field of women's work. It is for the purpose of undertaking this study that she gave up her connection with the Boston work, and has been lecturing and studying in different sections of the country.

There are three special problems to which Mrs. Woolman is giving her attention: (1) The training of teachers for vocational education. As a members of the committee of the National Society for the Promotion of Industrial Education she has frequent opportunity to assist in maintaining interest in legislation for state and national aid for vocational education. (2) The teaching of household arts in the elementary and secondary schools in relation to woman's interests in the home, and also in relation to the problem of enabling woman to enter industry on a progressively higher economic level when she does enter. Actual field work and study are valuable here, thru the spread of information as to conditions and methods that are to be found in places where superior results are being secured. (3) The training of women as purchasers and consumers. At a recent conference Mrs. Woolman testified that the impression of the importance of this phase of the work grows upon her more and more as she travels about the country. It is impossible to

estimate the influence of women in a collective demand for better products. Merchants are to a measurable degree helpless in the face of existing conditions relating to the sending out of goods on approval, accepting the return of goods sent out on charge accounts, extending of credit, costly delivery systems, and other evils.

It has been found possible to enlist the interest of many women in these problems by presenting them before women's clubs in all parts of the country. Instead of the customary lecture, a request is made for a two-hours period, in order that there may be opportunity for full and free discussion after the subject has been presented. The American Federation of Women's Clubs has recently adopted a resolution providing for a serious study for the next two years of the problems of the clothing of the family and the influence of woman as a consumer.

An effort is being made to collect the latest and best material suitable for publication dealing with: (1) The specific problems of vocational education for women, and the opportunities for training now available. (2) The academic background necessary and desirable for the woman worker in industry; methods of stimulating reading and study as a basis for industrial intelligence, and an interest in economic, civic, and labor questions. It is hoped that these researches may lead to improvement in the kinds of work offered to girls in the later grammar grades and high school. (3) Information concerning goods and materials offered for sale, especially textiles, in such form as to be available to and suitable for the ordinary woman purchaser.

Mrs. Woolman has unusual facilities for the prosecution of the investigations in which she is interested. She retains her connection with the National Society for the Promotion of Industrial Education, serving as chairman of the Woman's Committee, with headquarters at 140 West 42d St., New York City. She is a member of the committee on education of the Massachusetts State Federation of Woman's Clubs. As a members of the executive committee of the Woman's City Club of Boston she has been active in the work of organizing that influential group of women.

TO RIVAL ATHLETIC CONTESTS.

Dr. James P. Haney says that his department in the New York high schools has discovered a method of pitting teams of draftsmen against one another which is as effective as any relay race. For such a contest

the Municipal Art Society offered a trophy in the form of a bronze medallion designed by Victor D. Brenner. Teams of five students each met at the De Witt Clinton High School. Fourteen high schools were represented, the teams aggregating seventy students in all.

The first contest was a trial of speed and excellence in model drawing. A large number of groups of models were presented, and each student given thirty minutes in which to make a complete outline drawing of the group. After a rest of ten minutes, the contestants were tested in memory drawing. This "heat" proved very exciting both to the contestants and to the art teachers who were present as onlookers. A pitcher was shown full of difficult curves of lip and handle. The contestants were then required to draw from their constructive knowledge of form, a group showing this pitcher seen in two difficult positions. Thirty minutes only were allowed for the sketch.

Luis Mora of the National Academy, Laurel Harris, of the Mural Painters Society, and Dr. Haney acted as judges. All the judging was done independently, each judge being ignorant of the others' returns. Ten credits were given for each drawing or a maximum of three hundred for the team. De Witt Clinton High School won first place with a total of 258.3 counts. The Boys High School of Brooklyn, followed close behind with 242.4 points and the Bay Ridge High School and the Girls High School of Brooklyn tied for third place, with less than half a point between them. De Witt Clinton High School will retain the trophy for six months, after which it will be again put in another contest. Each member of the De Witt Clinton team received a bronze watch-fob of the same design as the trophy.

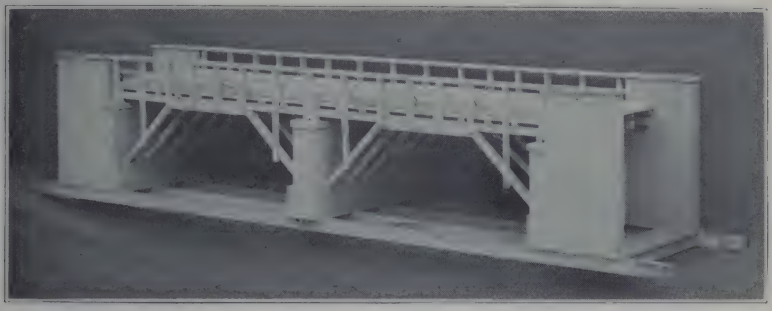
Dr. Haney says that the results of this competition have proved so helpful and stimulative of interest in good drawing, that it is expected that the School Art League will lend its aid by offering a trophy to be the subject of competition on the part of the higher classes in the high schools. All the pupils contesting for the Municipal Art Society Trophy were in the second year of the high school course.

WOODWORK FOR ENGINEERS.

The Instituto Technico Professional of Porto Alegre, Brazil, is the vocational school of a large engineering institution called Escola de Engenharia. The electrical and civil engineers study woodwork in the vocational school.



WAGON BRIDGE FOR COUNTRY ROADS. SPAN, 36 METERS; SCALE, 1 TO 10.



WAGON BRIDGE FOR SMALL STREAM. SPAN, 20 METERS; SCALE, 1 TO 10.



WAGON BRIDGE OF HIGH SPAN. LENGTH, 22 METERS; SCALE, 1 TO 10.

Note: The three bridges shown above were built under Harold E. Everley by Civil Engineering classes, 1914 and 1915, at the Escola de Engenharia, Porto Alegre, Brazil.

The electrical engineers are taught pattern-making, technology and other work connected with their course. The technology includes forestry, lumbering, manufacture of lumber, conservation and classification of woods and their commercial values, classification of tools and their uses.

The work for the civil engineers consists of technology and joinery—window, door, roof, floor, tower, scaffold and bridge construction. Scaffolding, towers, bridges, etc. are designed in the special drawing



CIVIL ENGINEERING CLASS IN BRIDGE CONSTRUCTION, 1914. ESCOLA DE ENGENHARIA, PORTO ALEGRE, BRAZIL.

classes and brought to the shop to be worked out. In the woodworking department these students are divided into groups of four or five and one member of each group appointed foreman. In this way much competitive interest is aroused, as the best model is used as a study in the school museum.

The model bridges built are of types most used in Brazil. Many bridges in various parts of the state have been constructed after models made in this school. Frequently excursions are made by the whole class to places where bridges are being constructed; sometimes the students remain there for weeks.

The photographs for the accompanying illustrations were furnished by Harold E. Everley, who, for the past three years, has been the head of the woodworking department in this school.

THE DECORATION OF HIGH SCHOOL BUILDINGS.

In New York City a serious effort has been made during the past two or three years to promote the decoration of school buildings with mural paintings. A number of societies have been enlisted, and steps are being taken looking toward the decoration of at least three of the large high school buildings. The Municipal Art Society has lent its aid in the decoration of the Washington Irving High School, and the Beaux Arts Society to the development of a competition for paintings for the foyer of the De Witt Clinton High School. Recently three large paintings have been completed and, thru the cooperation of the Mural Painter's Society, installed in the entrance stairway of the Eastern District High School in Brooklyn. The paintings are the work of Frederick Lincoln Stoddard of New York City, who is known for his mural paintings in the city hall at St. Louis, his stained glass window in St. Michael's Church in New York, a number of Mural panels in the high schools of St. Louis and a large lunette in the Hebrew Technical School for Girls in New York.



THE BIRTH OF THE ALPHABET. PAINTING BY FREDERICK L. STODDARD IN THE EASTERN DISTRICT HIGH SCHOOL, NEW YORK CITY.

The three panels for the Eastern District High School are each about eight by twelve feet in size. They represent the birth and development of education. The first panel represents the gift of fire to man, the second, the dawn of civilization, and the third, shown herewith, represents the birth of the alphabet when the earliest student is scratching with a broken spear the first letters upon a rock. Behind him warriors sneeringly look upon the first steps of learning, while in the foreground a serpent shrinks from the light of education which blazes before the writer. The color scheme of the first panel shows gray sky suggestive

of the darkness of ignorance; the second, or central panel, shows a morning sky with streaks of light symbolic of the coming day; while the third shows an intense blue sky emblematic of the noontide which is approaching. The central panel, with its scheme of green and gold dominates the two other panels.



POTTERY WORK. NORTH BENNET STREET INDUSTRIAL SCHOOL, BOSTON.

The North Bennett Street Industrial School, under the principalship of George C. Greener, is continuing its development work in ceramics. The school teaches all the processes of pottery work—construction by hand, wheel work, model making, slip casting, glazing and firing. The work done last year with sixteen year old boys indicates the possibilities of pottery making as a practical form of manual training.

The school fired its kiln twenty-six times last year, which meant an output of more than 1500 pieces. These included tiles, vases, in a variety of shapes, bird baths, etc., etc. Particular interest was shown in the new colors for glazes evolved at the school during the winter. These were Chinese apple green, Persian turquoise, and Italian pink.

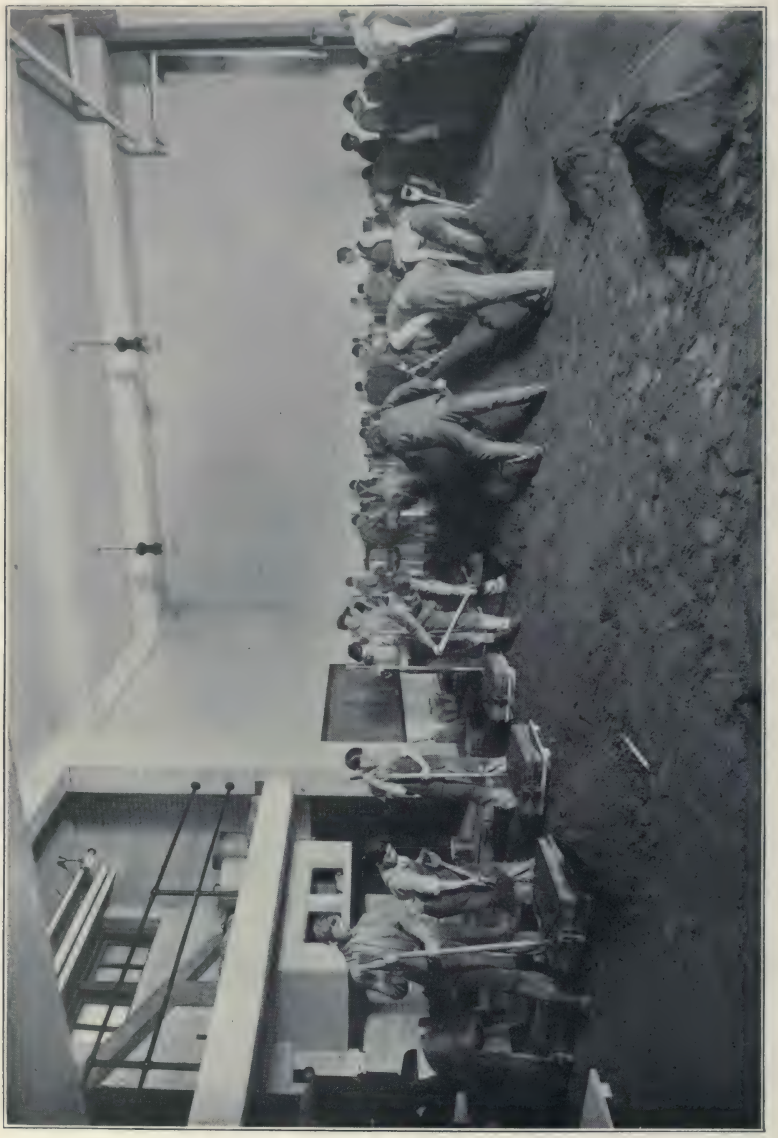


POURING OFF.



MACHINE SHOP WORK.

Note: The two photographs reproduced above were taken at the William L. Dickinson High School, Jersey City, N. J., where Frank E. Mathewson is in charge of the Technical and Industrial Department.



AT WORK IN THE FOUNDRY, WILLIAM L. DICKINSON HIGH SCHOOL, JERSEY CITY, N. J.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

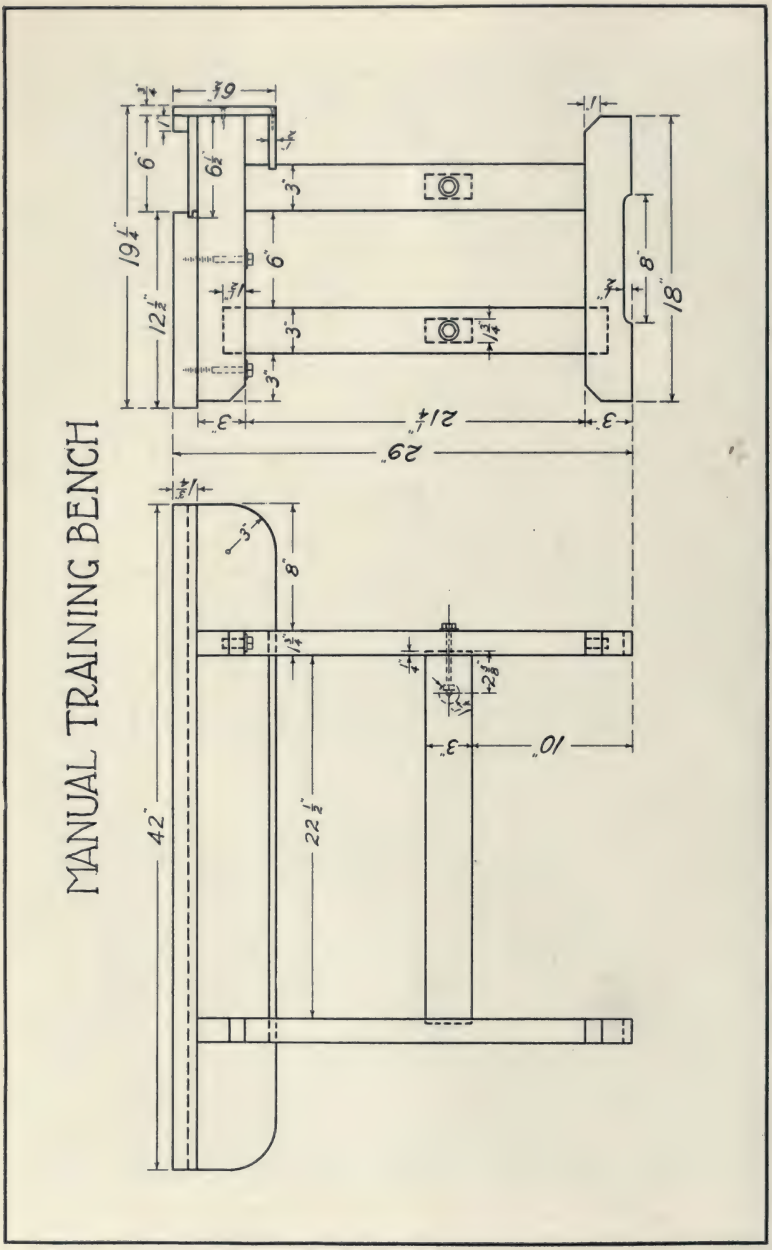
The success of this department is dependent upon the professional spirit of successful teachers who are willing to contribute material which may be helpful to others in the same or related lines of work. The editor is anxious to make these pages of the greatest possible service to the readers of the magazine, and to that end invites not only the contribution of good projects for publication, but also criticism and suggestions for improvement, and especially, requests for particular projects or information on special problems. For these reasons it is hoped that the response during the coming year may be as generous as it has been in the past.

The material in this issue centers around the idea of devices and equipment made in the school to aid in the up-keep of a shop and to secure greater efficiency in teaching.



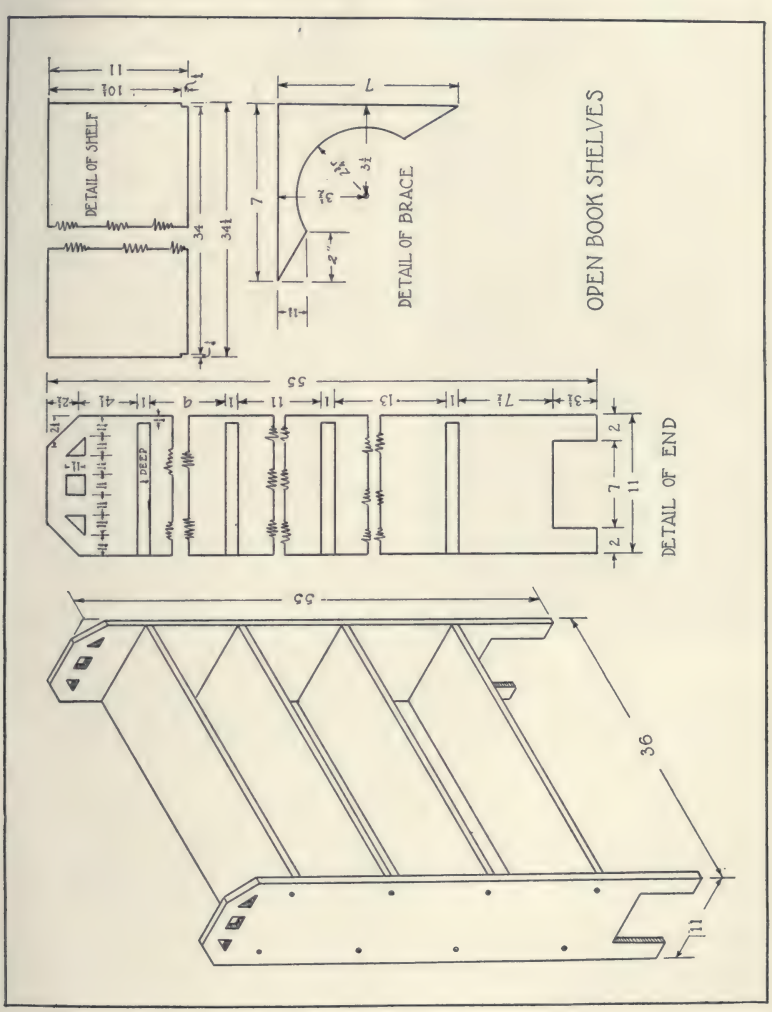
WORK BENCH

This project meets the need of the shop where one or more boys are found who are too small for the regular 32″ bench. Hard maple is used thruout, the top being made of four pieces 2⅛″ wide, glued up and planed to size. Several of


MANUAL TRAINING BENCH
42"
29"
21¼"
10"
8"
6"
3"
1¼"
1"
¾"

these benches were made by second year high school boys employing factory methods, tho most of the work was done by hand tool processes. Two boys acted as foremen taking charge of the "laying out," etc. The photograph shows the tool arrangement and the bench-stop screwed to the vise end of the bench.

—H. W. Kirn, Kenosha, Wis.



OPEN BOOK SHELVES

Bookcases are always in demand as shop projects. The drawing (page 69) and photograph contributed by Robert H. Smith, New York State School of Agriculture, Canton, N. Y., illustrate an original design that involves careful tool use. The ends are laid out and made "right and left," the gains for the shelves being left blind on the front. The openings at the top are laid out and cut from both sides to avoid splitting. The braces, eight in number, are made from 7″ squares of wood, the grain running parallel to the diagonal of the square. In assembling, all joints are glued. The shelves and braces are further fastened with screws. This book shelf can be made of almost any kind of wood and stained the desired shade. One use for it is to provide a place in which to keep tool catalogs, etc.



HARDWARE SAMPLE BOARD.

Every teacher of grammar grade shopwork appreciates the difficulty of teaching boys the correct names and sizes of such hardware as they may need in the usual class work. This problem was solved by Henry L. Buehren, Cincinnati, Ohio, when he devised the board shown in the drawing below which holds a sample of everything a 6th, 7th or 8th grade boy requires. Each pupil must consult this board and then give exact name, size or numbers as well as amount before he receives any. This has greatly relieved the work of dealing with nearly 500 boys each week.



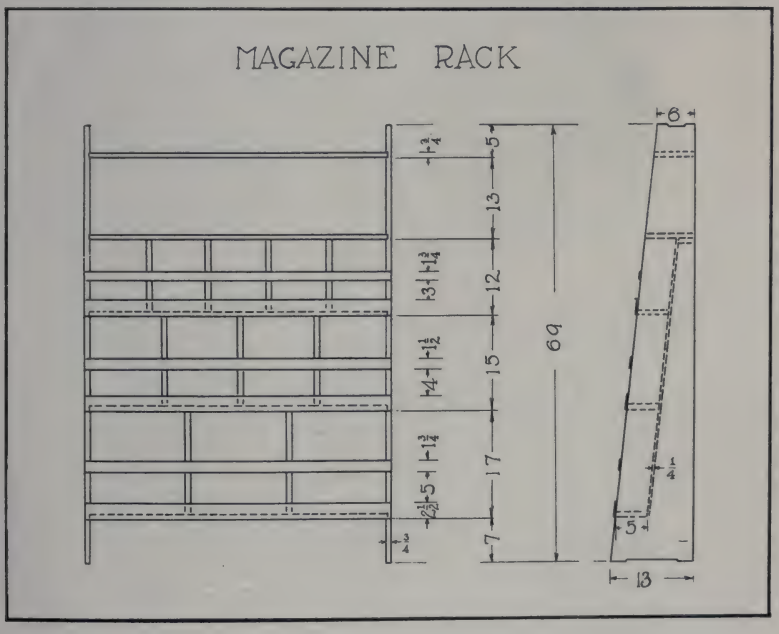
MAGAZINE RACK.

Every drawing room has its magazines pertaining to different branches of industrial work, and a more or less extensive collection of reference books. In the accompanying photograph and drawing is shown a simple rack which will serve the purpose in at least the small schools.



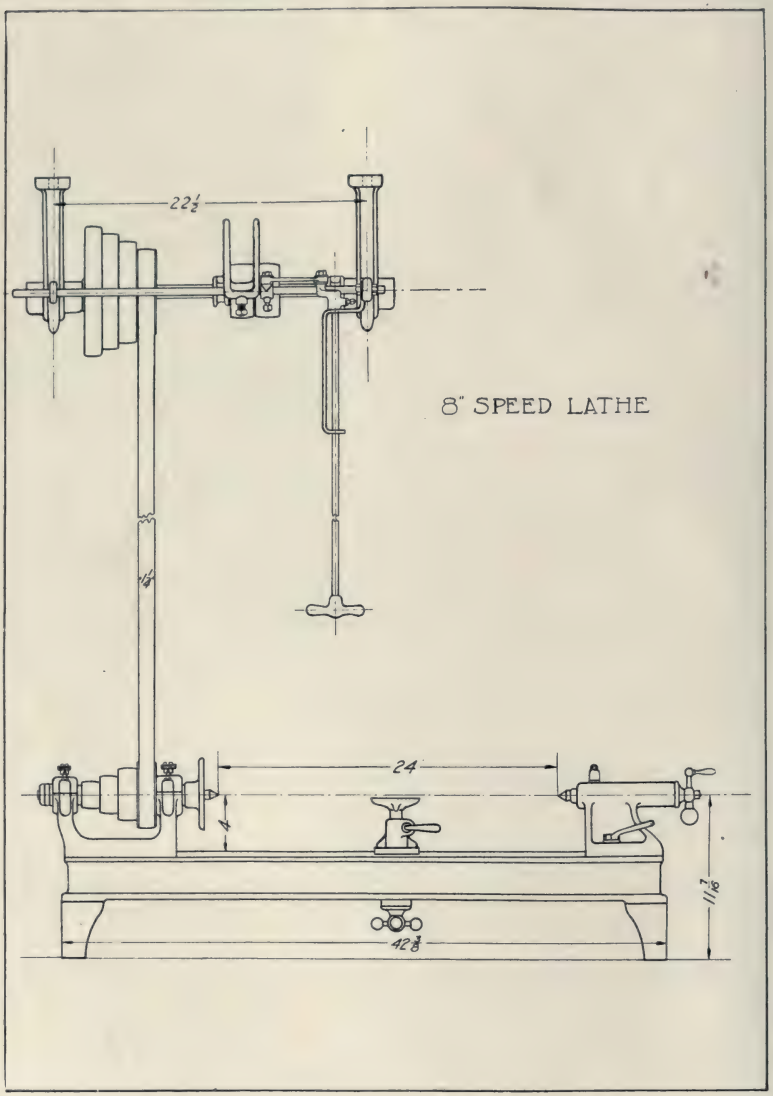
It may be constructed of any available wood. The two upper shelves are made the full width of the end, while the remaining three are five inches wider; all are set into the end ¼". The arrangement of the compartments will be governed by the size and number of magazines on the department's list. The back may be "compo" board or ceiling and is nailed to the backs of the shelves.

—H. A. CAMPION, Boise, Idaho.



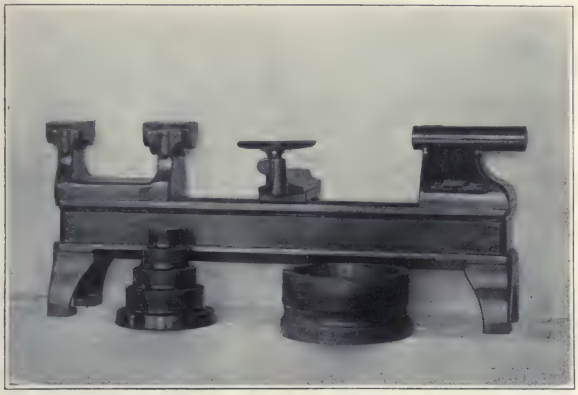
WOODWORKING LATHE.

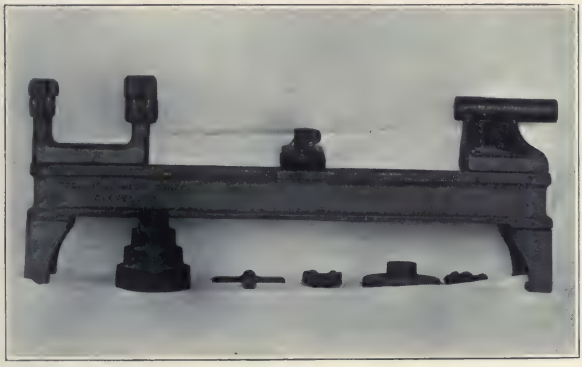
This project is one used at the East Technical High School, Cleveland, Ohio, the drawing and photographs showing the lathe in four successive states of completion: the design, patterns, castings and assembled lathe. Various parts of this machine are selected to make up a portion of the regular shop courses. These courses are correlated between the drawing rooms and shops, the boy following

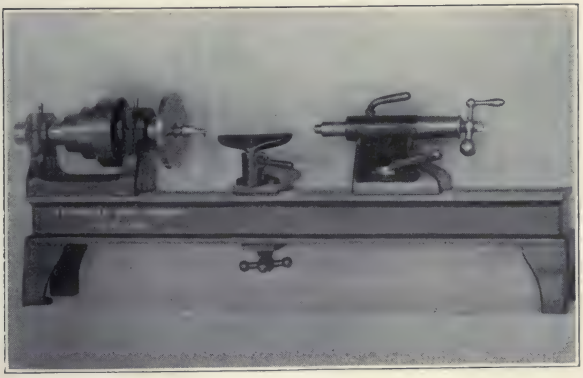


his own design thru the pattern shop and foundry. From 20 to 30 lathes are built each year, some of which are in use in the school. The boy who machines the lathe may keep it by paying for the material used in its construction.

—H. A. HUTCHINS, Asst. Principal.





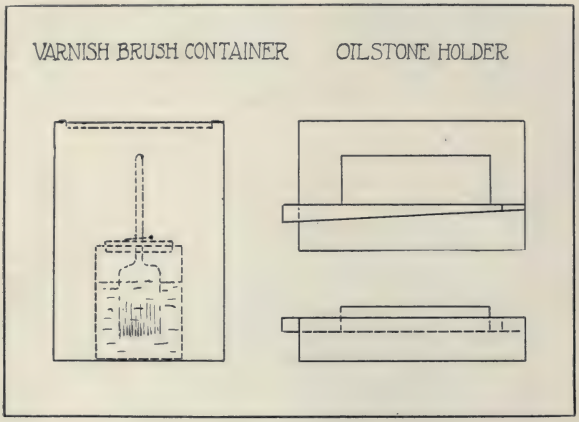


VARNISH BRUSH CONTAINER.

A varnish brush may be kept in perfect condition by boring a hole thru the handle large enough to admit a finishing nail which holds the brush suspended in a can containing a mixture of equal parts of varnish and turpentine. This can is fitted with a wood cover having an opening just large enough for the brush handle to pass thru. All is placed in a second can and covered tightly by a friction lid.

OILSTONE HOLDER.

An oilstone with fine and coarse surfaces may be held in a wooden holder as shown in the drawing. The stone is dropped into place with the desired surface up and then held firmly by the wedge.



SAFETY FIRST!

The machine woodworking shop of Bradley Institute has several machines driven from countershafts hung from the ceiling of the shop below. This necessitates that the person oiling or making repairs must work out of the range of vision of the instructor. The switch lock shown in the photograph (page 75) was devised to avoid possible accident by starting the motor when the oiler is at work. The horizontal member is fitted with two different locks, the bars of which keep the vertical member down on the points of the switch when locked. The oiler carries the key for one of the locks, and locks his side when he goes to work, thus preventing anyone from throwing in the switch and starting the machinery until he returns. The instructor may likewise lock his side when leaving the shop to prevent careless starting of the motor.

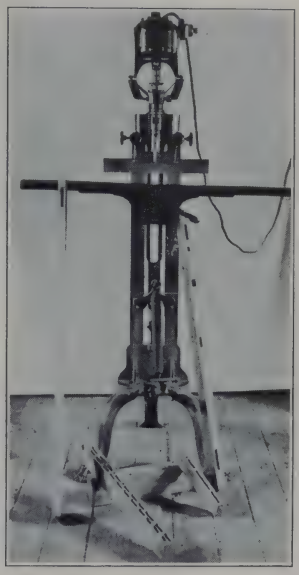
The three items above were contributed by H. L. Hurff, instructor in machine woodworking at Bradley Institute.

MORTISING MACHINE.

The accompanying photograph shows a Barnes foot-power mortiser fitted with an attachment for carrying a motor-driven hollow-chisel mortiser devised by F. A. Brackett of Lancaster, Wis. A patent has been issued covering the attachment and the machine is now on the market. It is regularly equipped with a ⅜″ hollow-chisel, run at 3600 R. P. M. by a 110 volt A. C. vertical motor, but can be fitted with a D. C. motor on order. Schools having the Barnes mortiser may purchase the attachment only. This machine seems to be the solution for the problem of the school shop where a low-priced mortiser running without jar or noise is necessary. The fact that it is portable is of value in certain shops.

—W. L. MATHEWS, Lancaster, Wis.



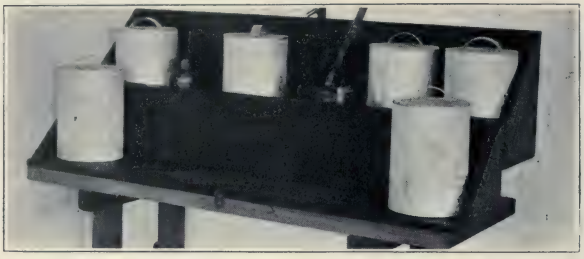


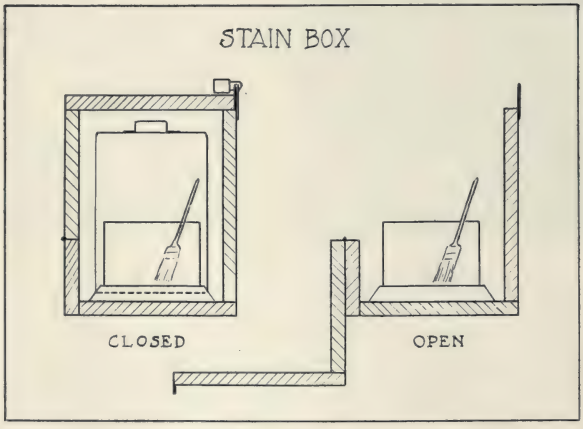
STAIN AND FINISH.

The corner of the room in which staining and finishing is carried on is often a source of annoyance to the teachers who wish to keep things in such condition that effective work may be done. The solution adopted for the shops of the Peoria, Illinois, grammar grades is indicated in the accompanying photographs and drawings. The stains and other finishes are put into granite pails about 6″ in diameter and 4″ high. These pails are set on blocks which are fastened to the bottom of the enclosing box. When not in use the stain in the container is protected from the air by a metal cover 7″ in diameter and 10″ high.

The container, brush, cover and block are all given the same number to avoid mistakes in returning things to their proper places. Several containers and covers are inclosed in one long box, the lid of which forms a shelf when open







as shown in the photographs and sectional drawings. The box can be locked with a padlock when not in use, thus presenting a neat and orderly appearance as well as preventing misuse of the bench and finishes.

A. P. LAUGHLIN, Supervisor of Manual Training.

REVIEWS

Handwork as an Educational Medium. By Philip Boswood Ballard, Inspector of Schools, London, England. The Macmillan Co., New York, 1915. 5x7¼ in.; 228 pages; price, $1.00.

This is the second and very much revised edition of a book issued by another publishing house in 1910. In fact, as the author says, "it is only by putting a violent strain on the notion of identity that it can be called the same book." All that part of the book not bearing strictly on handwork has been omitted and much new material added to the other part and then most of it rewritten. About half of the subject-matter is new. The author speaks of these changes as having been made to bring the book up to date, corresponding changes having taken place in educational thought. But in our estimation this is only part of the truth. The present volume is far more unified, deals with more material that is vital, and consequently should serve its purpose far better.

The book is essentially an effort to bring together into one volume the best thought on the educational value of handwork. It begins with considerations that are physical, then discusses the motor factor in emotion and volition, the relation between motor develpoment and mental development, play and work, handwork as an educative form of motor activity, the social aspect of manual training, ambidexterity, etc., and finally takes up questions bearing more upon the methods of teaching handwork.

The author contrasts the logical and the psychological methods in the development of subject-matter, and in doing so says that there have been three stages in the development of methods in teaching handwork in England—the first, in which the process was everything, the product nothing; the second, in which the product was regarded as of some importance but subservient to process; and the third, or coming stage, in which the process is subservient to the product. A most stimulating chapter is the one in which he discusses the place of drill in manual education and argues for the maxim, "First do a thing, and then learn how to do it." His frequent references to recent psychological research in America reveal an extensive academic study of the problems he discusses. In reading the book, however, one should keep constantly in mind that Dr. Ballard is writing especially with reference to handwork in elementary education, and much of the time with reference to handwork in the primary grades, and that he does not discuss the problems of vocational training in the secondary school period.

We look upon this volume as a valuable addition to the very few books on the pedagogy of manual training. In England it has been spoken of as "the best examination of motor education yet written."

Shop Projects Based on Community Problems. By Myron B. Burton. Published by Vocational Supply Company, Muncie, Ind., 1915. 6x9 in.; 382 pages; illustrated; price, $1.15.

This book is primarily a collection of sixty projects with suggestions for others grouped into six sections. Each section is made up of a series of lessons

giving in each case an introductory statement such as might be made to a class beginning a new problem; a list of references for further reading or research; a working drawing and detailed directions for constructing, assembling and finishing the project. At the end of each section is found a series of questions intended to stimulate a closer study of the community and its problems and a second series of review questions such as may be found helpful in testing the information acquired by the class.

The last 100 pages are devoted to a supplement giving (1) directions, etc., for making mechanical and shop drawings; (2) tool processes; (3) varieties of timber; (4) wood finishing; (5) principal joints used in woodwork; (6) tool sharpening.

The giving of a complete bill of material with each project is questionable since it permits a pupil to get out his stock without reading his drawings at all. On the other hand, many of the problems are new and have an intimate relation with the boys' life. The agricultural projects are especially worthy of mention while the reference lists and the suggestions for community research should prove very helpful. —ALBERT F. SIEFERT.

Metal-Work. By Hugh M. Adams and James H. Evans. Published by Longmans, Green & Co., 1914. 5x7½ in.; 336 pages; price $1.40 net.

This book, written by two English teachers of metal-work ought to get the attention of teachers of manual training in America (1) because manual training work in metal has been more extensively developed in England than in this country, especially in the grammar grades, and (2) because this book is a comprehensive textbook on the subject. While it is not intended to be exhaustive, it does cover the operations and general principles involved in metal-work as taught in the best English schools of manual training. The book contains no course of models or drawings of problems to be worked out, but it is rich in the amount of information about tools, materials, and processes which should accompany any course in metal-work worth teaching. The authors state that "the best courses are those determined by the varying conditions under which the teacher works, and which are evolved from experiences and circumstances arising in the handicraft-room."

The book is in three parts. The first deals with metallurgy, the second and main part, with tools and processes, and the third gives suggestions about equipment, motive power and shafting, and gives a variety of information more espeically for the teacher. Appended to the book are sample examination papers in metalwork given by the City and Guilds of London Institute. The field covered in Part II is indicated by the fact that it includes vise work, sheet-metal work, forging, drilling and riveting, foundry work, lathe work, and repoussé and other art metal processes. On the whole this is the best textbook we have seen covering the broad field of elementary metalworking.

Bookbinding and its Auxiliary Branches. By John J. Pleger. Published by The Inland Printer Company, Chicago, 1914. In four volumes as follows:

Part I—Paper Ruling. $1.25.

Part II—Pamphlet Binding, Punching, Crimping and Quarter Binding. $1.50

Part III—Blank Edition and Job Forwarding, Finishing and Stamping. $2.00

Part IV—Gilt and Goffered Edges, Marbling, Hand Tooling and the Care of Books. $1.25.

This series of books presents modern bookbinding as it is carried on by the best book manufacturing establishments. It deals with machine methods instead of hand-tool methods. It deals with the production of books by the thousand and hundred thousand instead of the single volume. Each volume contains illustrations of modern machinery for its section of the subject.

The books are written by a practical working bookbinder who has had charge of several large establishments. These books are intended to help in standardizing practice in the factories.

RECEIVED

Some Facts Concerning the People, Industries and Schools of Hammond. By Robert J. Leonard. This is a 165 page pamphlet, being a study of the industrial and educational conditions in Hammond, Indiana, prepared thru the cooperation of the Department of Industrial Education of Indiana University and the Vocational Division of the State Department of Public Instruction. Its purpose is to suggest a program for elementary industrial, pre-vocational and vocational education for Hammond. This has been done in the Chapter VII. The whole study, but perhaps especially this chapter, will be of great interest to directors and supervisors of manual arts in public schools.

First Annual Report on Vocational Education in Indiana. By W. F. Book. This report covers state-aided vocational schools and departments of schools, instruction in practical arts in public schools, extension work of county agents of agriculture, and boys' and girls' clubs and gardening work.

The Teaching of Art to Museum Audiences of Children. By Dr. James P. Haney, Director of art in high schools, New York City. An address given before the American Federation of Arts at the Washington meeting.

Short-Unit Courses for Wage Earners and a Factory School Experiment. Bulletin No. 159, Bureau of Labor Statistics, Washington, D. C. The first part of this bulletin, concerning short-unit courses is by Wesley A. O'Leary and Chas. A. Prosser; the second part on a factory school experiment is by Charles H. Winslow.

Industrial Survey of Cincinnati—Vocational Section—Printing Trades. Chas. R. Hebble. Published by the Chamber of Commerce, Cincinnati, O.

A Study of the People of Indiana and their Occupations for Purposes of Vocational Education. By Robert J. Leonard, Indiana University Studies, No. 26. Contains 143 pages. The facts gathered together in this study are intended to be used as a "basis for determining the general content of courses in elementary industrial art, pre-vocational courses in agriculture, industry, commerce, domestic and personal service, and vocational courses in 'constant' occupational pursuits" in the state if Indiana.

What is Involved in Vocational Education. By Eugene Davenport, dean of College of Agriculture, University of Illinois. University of Illinois Bulletin, Vol. XII, No. 19.

Vocational Education and Vocational Guidance. A Survey and Preliminary Report by a committee appointed by the Iowa State Teachers' Association. Published by the State Department of Public Instruction, Des Moines, Iowa.

Manual Training Course in Concrete. A booklet of 99 pages, published by the Association of American Portland Cement Manufacturers, Bellevue Court Building, Philadelphia, Pa. Contains 15 plates of drawings.

Employment Certificate System, Connecticut. By Helen L. Sumner and Ethel E. Hanks. Published by the Children's Bureau of the U. S. Department of Labor, Washington, D. C.

Proceedings of the National Vocational Guidance Association. For the meeting held in Richmond, Va. Published by the Association. W. Carson Ryan, Jr., secretary, Bureau of Education, Washington, D. C.

Vocational Training in the United States. A summary by Wallace E. Hackett. Published by the Board of School Directors, Reading, Pa. It gives a list of the practical arts subjects taught in each grade in 147 cities in the United States and the time devoted to these subjects.

Vocational Education. Report of a committee of the Commonwealth Club of California, Archibald B. Anderson, State Normal School, San Francisco, Chairman.

The Need for Art in Life. By I. B. Stroughton Halborn. Price 75 cents. G. Arnold Shaw, 1735 Grand Central Terminal, New York.

Lessons in Elementary Agriculture for Alabama Schools. By E. A. Miller. A course outlined by months. Bulletin No. 258, U. S. Department of Agriculture.

The School and the Immigrant. Edited by Albert Shields; prepared by direction of the Board of Education, New York City.

Outines of Thirty-six Lessons in Agriculture. For use in the seventh and eighth grades. By William H. Davis. Issued by the State Department of Public Instruction, Des Moines, Iowa.

Manual in Woodworking for Philippine Public Schools. By Frank W. Cheney, Philippine School of Arts and Trades. A well illustrated book of 122 pages published by the Bureau of Education, Manila.

Report of the Director of Technical Education and Manual Training, Auckland, New Zealand, 1914. By George George. This report covers primary handwork, domestic science, manual training, agricultural education, technical training of teachers, technical and continuation classes in county centers and the work of the Seddon Memorial Technical College.

How the Sunday Lady Won the Mountains. By Lucian Lamar Knight. The vitally interesting story of the Berry School, Mount Berry, Georgia.

What the Public Schools of Indiana are Doing in Pre-Vocational Agricultural work. By Z. M. Smith. Bulletin No. 16, Vocational Series No. 16. State Department of Public Instruction, Indianapolis, Indiana.

FIELD NOTES

A great educational conference is to be held in New York City from September 23 to October 2, under the auspices of a local committee representing the New York City board of education, the New York City Federation of Women's Clubs, and several other local organizations. Invitations have been sent to experts in every branch of industrial education and vocational training in both public and private schools in all parts of the country. A national conference committee of more than 150 members representing the various interests involved has been formed. The Twelfth Regiment Armory has been engaged for a great exhibition of school work and many important exhibits have been promised. Business men are cooperating in the enterprise, and there is reason to believe that in size and importance this conference will be the greatest ever undertaken in this country in the interests of industrial education. The headquarters will be at Hotel Biltmore, where many of the sessions of the conference will be held. The chairman of the local committee is John Martin, member of the New York City board of education. The executive secretary is A. D. V. Storey whose address is Hotel Biltmore.

The ninth annual meeting of the National Society for the Promotion of Industrial Education will be held in the city of Minneapolis during the third week in January, 1916. The great feature of the convention will be the presentation of the results of the Minneapolis Survey, which is being carried forward under the direction of Dr. Charles A. Prosser, former secretary of the National Society and now the director of Dunwoody Industrial Institute of Minneapolis. Dr. Prosser, in turn, is under the survey committee of the National Society of which Charles R. Richards, director of Cooper Union, New York City, is the chairman.

The Alumni Associaion of Teachers College, New York City, has undertaken to raise a fund for welfare work, to be a memorial to Miss Grace H. Dodge. This fund is intended to take the place of numerous personal gifts by Miss Dodge to meet special needs among the students. In this way the Alumni hope to continue that intimate, personal work of helpfulness that has been done by Miss Dodge from the beginning of the institution.

Last year about $375,000 was spent on continuation and industrial schools in the state of Wisconsin; this year that amount will probably be increased to $450,000. Because such large sums are being spent without adequate supervision, members of the State Board of Industrial Education are urging that another man, an assistant state supervisor of industrial education, be employed to go about among the cities "with which the state is in partnership in this work" and see that every dollar is wisely spent and that the quality of the work being done is kept up to a high standard.

Brooklyn, New York has opened a new trade school for boys. This is the first in the Brooklyn Borough of New York City. At present it occupies space on the seventh floor of the Cary Building. The nucleus of attendance was 54 Brooklyn boys who had been attending the Murray Hill Trade School on Thirty-seventh Street, Manhattan. The capacity of the school is 224 boys, and it is expected that this will be reached during the present month. The principal of this new school is George J. Loewy, who is also principal of the Murray Hill School. The teachers are: James H. Allen, history and civics, and acting principal in the absence of Mr. Loewy; John S. Keresy, English; Robert L. Browne, industrial geography; L. McSherry, machine shop practice; L. A. Prendergast, printing; Charles Kaplan, garment designing; Louis Taylor, mechanical drawing; R. D. Gravatt, sheet-metal work; E. Hohn, electrical wiring. It is hoped that the school will be opened to night classes.

About a year ago Wilkinsburg, Pa., started grammar grade work in manual training by establishing a center in the high school building. This center included a shop equipped with benches; a machine room with a universal circular saw, jointer, mortiser, band-saw, oilstone

FIELD NOTES—(*Continued from p. V.*)

grinder and three lathes; a mechanical drawing room; and a lumber room. The work was taught by Lynn D. Rockwell. This year Mr. Rockwell has an assistant and the scope of the work is being extended to include some high school classes.

Professor Fred C. Whitcomb of Miami University is spending part of a sabatical year in traveling with his family in an automobile thru the Central and Western States. He is going from city to city visiting industrial plants and schools where the manual arts are being taught. Especially he is making an analytical study of industries with reference to the education of industrial workers. He will cover a wide range of territory and an equally wide range of industries. As a matter of course, he will spend considerable time at the exposition in California. Forest T. Selby will act as head of the Manual Arts department while Professor Whitcomb is away, which will be until Feb. 1, 1916.

Miss Marianne Mitchell from the Muskegon High and Hackley Manual Training School, has accepted a position as assistant to Professor Whitcomb of Miami University, Oxford, Ohio. She has had several years of work in designing at the Rookwood Pottery in Cincinnati and is a graduate of Teachers College, New York City, where she was for some time an assistant in art at the Horace Mann School. At Miami she is to teach design and handicrafts. She is given the rank of assistant professor.

British Columbia is taking steps to give more practical training in handwork to the teachers of rural and small schools. The following outline of work has been received from L. A. Campbell of Victoria: (a) The making of such things as flower box, milking-stool, hot-house frame, sawhorse, chicken coop, troughs of different kinds, gates, ladders, bee-hive, etc. (b) The care and sharpening of tools. (c) Preservation of wood by tar or paint. (d) Concrete work. (e) Simple iron work. (f) Rope and string work.

This course does not attempt to train a teacher to become a manual training specialist, but aims at providing the regular teacher with the training necessary to carry out suitable projects in a district where no special manual training center has been established.

For five years the manual training work in the schools of Nashua, N. H. has been developing under the supervision of Ernest W. Beck. During the past year substantial additions have been made to the machine shop equipment, and plans are under way for a new building to be used for manual training purposes.

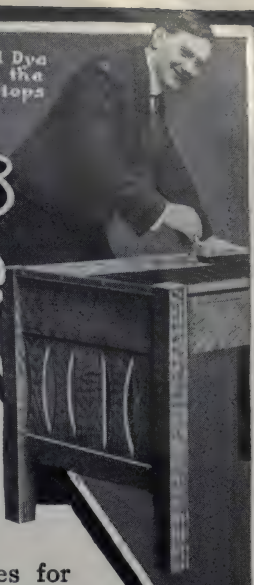
Each year the U. S. Government contributes a little more service to the public schools. One way in which it is helping is by sending lantern slides on forestry. Several sets are now available. They are loaned for short periods on condition that the borrower agrees to pay transportation charges from Washington and return, and to be responsible for slides lost or broken. Several of these collections are of special value to teachers of woodworking. Applications should be made as long as possible before the date on which they will be needed so that reservation can be made. Make application to The Forest Service, U. S. Department of Agriculture, Washington, D. C.

Charles E. Cleveland, principal of the Trade School, Portland, Oregon, recently returned from a three weeks' tour thru the Eastern and Central States where he went to study industrial and trade schools. According to the *Portland Oregonian,* Mr. Cleveland places the William Dickinson High School of Jersey City as first on the list of public schools of this class. Here he found 600 pupils in the industrial department. Among the philanthropic institutions he gives very high rank to the David Rankin Jr. School of Mechanical Trades in St. Louis.

What has been termed the first vocational state-aided agricultural high school in Indiana has been opened in Van Buren township. The summer work carried on by the instructor consisted of demonstrations in soils, horticulture, live stock and poultry.

(*Continued on p. VIII.*)





Johnson's Wood Dye

is used in nine-tenths of the Manual Training Schools in the United States and Canada for finishing wood and reed models. Johnson's Wood Dye is a combination spirit-oil preparation, embodying all the good qualities of both a spirit and an oil stain, with the disadvantages of neither. One of its greatest advantages for manual training work is the fact that it dries ready for the finish in 15 minutes. It is very easy to apply and most economical to use. Made in 17 shades, including Mahogany, Early English, Mission, Weathered, Fumed, Golden Oak, etc. Put up in wide-mouth glass jars in all sizes from Quarter Pints to Gallons.

Johnson's Prepared Wax

is the proper finish for use over the dye. Simply apply with a cloth and polish in two or three minutes with a dry cloth. The finish obtained is beautiful, artistic and velvety. Does not show finger marks or scratches and stands a lot of wear.

Where a *higher gloss* than a wax finish is desired, apply a coat of *Johnson's Under-Lac* over the Dye and then one coat of Wax or Varnish, whichever is preferred. For a *hand rubbed effect* without the labor of rubbing, use *Johnson's Flat Wood Finish* over the Dye. For *filled* or *grain effects* use *Johnson's Paste Wood Filler.*

Manual Training Instructors who have not our Instruction Book and portfolio of Finished Wood Panels will be supplied without charge by writing us direct.



S. C. Johnson & Son

"The Wood Finishing Authorities"

Dept. MT6

Racine, Wis.



VOCATIONAL BOOKS

Anthony's Elements of Mechanical Drawing
Gives a thorough drill in geometric construction and the theory of projection as applied in a wide range of practical drawing. **$1.50.**

Anthony's Machine Drawing
A handbook and text, valuable as a brief course, covering the essentials of the subject. **$1.50.**

Daniels's Freehand Lettering
A practical manual, including plates of alphabets. **$1.00.**

Dooley's Textiles
Valuable for its accurate data regarding textile fabrics, their manufacture and use. **$1.25.**

Dooley's Vocational Mathematics
For beginners and for shop-workers. No other book includes so many industries in so teachable a form. **$1.00.**

Halstead's Working Drawings for Cabinet-Making Models
A collection of working drawings of furniture for high school classes. **$2.00.**

Halstead's Manual Training in the Grades
A collection of working drawings of models for the 5th, 6th, 7th and 8th grades. **$2.00.**

Reilly's Rational Athletics for Boys
Commended by the leaders in physical education. **90 cents.**

D. C. Heath & Co.

BOSTON NEW YORK CHICAGO

American Publications

THAT TEACHERS VALUE

VOCATIONAL AND INDUSTRIAL TEXTS

Vocational Guidance *J. Adams Puffer.*
It enables the teacher to guide the child and to judge his tendencies and abilities. Gives great number of occupations, their advantages and disadvantages, Illustrated. Price, $1.25.

Hand-Loom Weaving *Mattie Phipps Todd.*
Weaving for the grades from the simplest to the most complicated designs. Suggestions for songs, games, and stories to accompany the work. Well illustrated. Price, $0.90.

Industrial Work for Public Schools
Holton and Rollins.
Construction work, weaving, rug making, sewing, and iron work rouse the creative instinct, discipline the student, and teach self-direction. Exquisite nature poems. Illustrated. Price, $0.90.

THE GOODE WALL MAPS
By Professor J. Paul Goode, University of Chicago.

Give America the Right to Rank with Europe in the Art of Cartography

"The teachers of the Training School say that the maps 'just talk'. The series is decidedly superior to any set of maps I have ever seen, even after a careful examination of the map establishments in Paris, Berlin, London. These maps give America the right to rank with Europe in the art of cartography."
L. H. Woods, Professor of Geography, Western State Normal School, Kalamazoo, Mich.

Rand McNally & Company

CHICAGO NEW YORK

FIELD NOTES

(*Continued from p. VI.*)

The new Pullman Free School of Manual Training is to open in October at Pullman, Ill. This represents an expenditure of more than $400,000.

The school board of Leominster, Mass., has decided to take advantage of the opportunity to establish a state-aided vocational class in the Leominster high school. Half of the work will be in agricultural subjects and half in regular school subjects. The state will pay two-thirds of the salary of the instructor for this class.

Both the number of farmers' institutes held each year and the attendance at these meetings is steadily increasing, according to a report on farmers' institute work which has just been published by the United State Department of Agriculture as Bulletin No. 269. During the fiscal year ending June 30, 1914, the report states, 25,238 of these institutes were held throughout the country, with a total attendance of 3,656,381. This is an increase in atendance of 26 per cent over that of any previous year.

At Woonsocket, R. I., a new equipment is being added for manual training work, and the superintendent of schools has recommended a combined high school and trade school course for students who wish to specialize in mechanical work during the high school period.

The four vocational schools of Buffalo, New York, sent out 54 graduates last year. In addition to the certificate of graduation each boy received a state vocational school diploma which is equivalent to a grammar school diploma in that it will admit to any of the high schools of the state if the boy wishes to study there.

A printing plant has been purchased by the school committee of Leominster, Mass., and will be used by the manual training department.

Under the management of Miss Florence M. Marshall, the Manhattan Trade School for Girls has become self-supporting. Out of the earnings of its several departments all materials used and all equipment added are purchased. The annex recently opened was completely equipped

(*Continued on p. X.*)

Back on the Job With Carborundum Sharpening Stones

ONE of the first things to do when teacher and pupil start the September term is to put every edge tool in the school in working shape.

Carborundum Sharpening Stones and Grinders

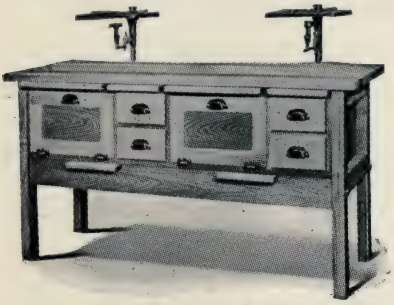
Should be right handy for the job—keep in mind the special Carborundum Manual Training Stones—hard, sharp, fast-cutting stones made especially for manual training work.
And then for the tool and general grinding tasks, there are the Carborundum Niagara Grinders strong, durable, easy running—each equipped with a genuine Carborundum wheel.

¶ Have the pupils read of the making of the wonderful Carborundum crystals in the electric furnace? ¶ Let us send supply of instructive booklet "*The Romance of Carborundum.*"

The Carborundum Company, Niagara Falls, N.Y.







You will be interested in my new catalog.

MY catalog No. 22 is all ready for the call now.
¶It is just fresh off the press and is brimming over (from page one to page fifty-six) with tables and benches attractive to the student, at prices attractive to the board.
¶It is bound like a book, and will stand the wear and tear necessary for filling big orders and little ones.
¶I can't tell you all about it here. The best way is for you to send for your copy—it's waiting.

C. Christiansen
Manufacturer
Manual Training Benches
Domestic Science Tables
and Drawing Tables
2219 Grand Ave., Chicago

A Penny Postal Will Bring It to You.

Cabinet Hardware, Metalworking and Other Craft Supplies

New catalog No. 15 will be mailed to our customers about September 15.

THE THOS. K. LEWIS CO.
R. 167 E. 11th Ave. COLUMBUS, OHIO

FIELD NOTES.

(*Continued from p. VIII.*)

without asking the board of education for a dollar. In fact, except for teachers' salaries and maintenance of the building, the school has for two years been operated without cost to the taxpayers.

The Chamber of Commerce of Rochester, New York, has recommended to the board of education of that city that courses in salesmanship be added to the curriculum of the Rochester public schools. In reaching this action the committee on commercial and industrial education was assisted by an address given by Mrs. Lucinda Prince of Boston.

The city of Syracuse, New York, is just starting to build a vocational high school which is expected to cost $400,000.

The College Club of Pittsburgh has opened a vocational bureau. Miss Esther M. Smith, a graduate of Smith College, who has had experience in similar work in Chicago, is in charge.

At Holyoke, Mass., the carpenter's union has approved the suggestion that the vocational school students construct a modern residence. All work, however, must be under the direction of competent instructors.

Plans have been drawn and work is being advanced on a new home for the Manhattan Trade School of New York City. The new site is on East Twenty-second Street. The building will cost $275,000.

Mrs. Harry Payne Whitney has announced a series of prizes for the best works of painting, black and white drawing or sculpture on "The Immigrant in America." The total amount of prizes is $1,100. The contest closes November 1st. Information can be obtained from Frances A. Kellar, 95 Madison Ave., New York City.

The school trustees of Butte, Montana, have approved the recommendation of the recent survey directors that an intermediate or junior high school be established in that city.

(*Continued on p. XII.*)



This bench is admirably fitted for sectional classes.

KEWAUNEE FURNITURE FOR MANUAL TRAINING

Good equipment is an inspiration to better work—with the hand as well as the head.

Kewaunee Equipment is different from any other Manual Training furniture you have ever seen. It is not rough and uncouth—it stands alone in being built and finished as well as skillful workmen know how.

It will elevate its surroundings to the dignity that any serious school of Manual Training should possess.

Full information gladly supplied.

Kewaunee Mfg. Co.
LABORATORY FURNITURE EXPERTS
KEWAUNEE, WIS.

THE OBJECT OF THE MODERN SCHOOL CURRICULUM

should be to turn out fully developed and many-sided brains. That brain is only half developed, half educated, which has been denied the development which comes from training in motor activity, and this training is given by a course in carpentry in the public schools. Our booklet, "The Professor and the Saw", states in full the advantages of such a carpentry course, gives valuable information as to the proper tools for such a course, and describes how to build a number of useful things.

Problems often arise after the installation of a manual training course in carpentry, and to the study of such problems the Simonds Manufacturing Co. has given much time. Simonds saws are the perfect saws for the perfect mechanic. If you are considering the establishment of a carpentry course, or are meeting difficulties in carrying on such a course, we should be glad to have you consult us. Our experience and advice will be placed freely at your disposal.

"If you want saws that cut like diamonds
Ask for saws that are branded Simonds"

Write for our booklet 3, "The Professor and the Saw". It will be sent postpaid.

SIMONDS MANUFACTURING CO.
"THE SAW MAKERS"
5 Factories---11 Branches
FITCHBURG, MASS.

A
GOOD CHAIR
WITH A
GOOD CUSHION
IS A
COMBINATION
HARD TO BEAT



The good chair can be made in your manual training department, but the good cushion on account of the difficulty in getting proper materials, must be purchased elsewhere. The "Grand Rapids Cushion Co." is fully equipped to handle this class of work having furnished cushions for Manual Training Schools in all parts of the United States. For full information write

Grand Rapids Cushion Co.
219 S. Division Ave. GRAND RAPIDS, MICH.

Wallace Machine Shop Projects

Fourth Season

Make this year's machine shop work thoroly successful by using WALLACE castings and blue prints.

Write for descriptive booklet now.

J. D. Wallace
529 West Van Buren Street
Chicago, Ill.

FIELD NOTES

(*Continued from p. X.*)

Waterville, Maine, is introducing manual training this year with Samual D. Allen as instructor.

Steelton, Pa., has installed a manual training department consisting of two shops, one in the high school building and the other in the hygenic building. At present the work is carried on in the seventh and eighth grades, but it will be extended year by year thruout the high school. J. LaBarre Folker, formerly assistant director of manual training at Lebanon, Pa., is director of the department.

Charles R. Bostwick has given up his position as supervisor of industrial education at Plainfield, N. J., to accept the principalship of the Boys' Manual Training School in the Kamehameha Schools, Honolulu, H. I.

Professor J. Lawrence Laughlin of the University of Chicago, has announced the prize essay contests for 1916 on economic subjects. A circular suggests subjects and announces conditions.

Two hundred and fifty thousand dollars has been willed by the late General Charles H. Pine for the erection and maintenance of a manual training school in Ansonia, Conn., his home town. Practically all of his fortune will be devoted to furthering education, as the remainder of it will eventually be added to the $50,000 Charles H. Pine Scholarship Fund which he established three years ago at Yale University.

One of the women's clubs of Kenosha, Wis., has established, in cooperation with the school authorities, a school for training house maids. The students are employed in the homes of the patrons of the school for a few hours daily, that they may practice under normal conditions what they are learning at school. This school has been organized, not only as a method of solving the servant problem for the housewives of Kenosha, but as a means of making the girls such efficient workers that they can command good wages.

TRADE NOTES

Manual training teachers in the Mississippi valley will be interested in learning that R. S. Thompson, who has been identified so long with the Orr & Lockett Hardware Company, has resigned to become president of the Thoben Manufacturing Company, Chicago. To this new position Mr. Thompson brings twenty-three years of acquaintance in the hardware field, and this will be a valuable asset to the firm in their manufacture and sale of a new line of hardware specialties. In leaving the school field Mr. Thompson will take with him the best wishes of everyone who knows him. His genial good humor and uniform courtesy have made him deservedly popular.

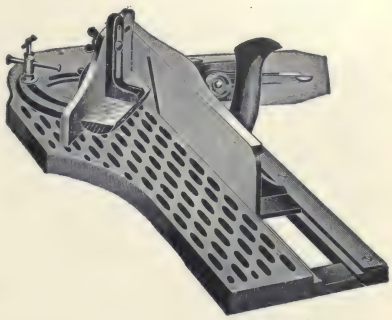
One of the features of modern education is the practice of taking students to visit manufacturing plants of various kinds, thus enabling them to learn something of the many factory processes. Two groups of sophomore students from the mechanical engineering course at the Worcester Polytechnic Institute recently visited the plant of the L. S. Starrett Company at Athol, Massachusetts. The men were taken in small groups, each in charge of a competent conductor, thru the many departments of the plant.

The Goodell Manufacturing Company, Greenfield, Massachusetts, manufacturers of the Goodell Steel Miter-box, have recently made the statement that in the ten years since their miter-box was put on the market they have received less than $15.00 for replacements. This miter-box is practically unbreakable and therefore has found a large sale in manual training schools. It has several special features, some of which are covered by basic patents.

Perhaps the most popular tool manufactured by The Stanley Rule & Level Company, New Britain, Connecticut, is their well known "Bed Rock" plane. Its solidity and one-piece effect is due to the fact that the entire under surface of the frog is in perfect contact with the solid seat cast in the plane botom. The frog and the bottom are so perfectly fitted together that from the plane-iron to the bottom, the plane is as one

(*Continued on p. XX.*)

Stanley Tools



STANLEY SHOOT BOARD AND PLANE

This combination of Plane and Shoot Board (sometimes termed "Jack Board") will be found to be one of the most useful tools in the Woodworking Department of a Manual Training School.

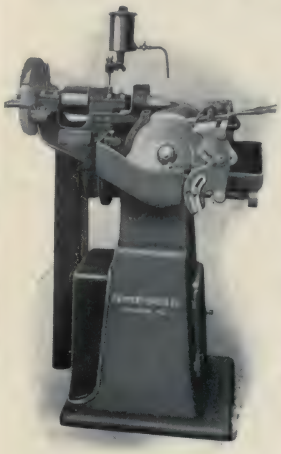
The Board is made of special iron and is of ribbed construction, to give strength without excessive weight.

The Plane is specially constructed for the Board, and moves in an adjustable runway, accurately machined. This insures absolutely the same position of cutter for every stroke, and as the cutter is set on a skew, a very smooth, clean cut is obtained.

Our catalog No. 34-K describes this combination in detail. We should be glad to mail a copy to anyone interested.

STANLEY RULE & LEVEL CO.
NEW BRITAIN, CONN. U.S.A.

Mummert-Dixon Oilstone Grinders



No. 481-A

The Five Feature System embraced is our origin.

We have a complete line with a machine for every purpose.

Send for catalog.

MUMMERT-DIXON COMPANY
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Oliver Machinery Co., Ltd., Manchester, England, sole agents for Great Britain.

GEMS

Sent on Approval to Jewelry Craft Workers and Schools and Colleges

ESPOSITER VARNI Co NEW YORK

You may send to us for a collection of gems. After selecting those you want, return the remainder. When writing for gems give us full information of your requirements and furnish us a reference.

We supply Diamonds at regular wholesale prices.

"A Guide for Gem Buyers"—a book just issued, illustrated, full of interesting information concerning gems and of value to all jewelry craft workers, gratis on request.



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Gem Dealers and Cutters
49 John St. Dept. A New York

TRADE NOTES

(*Continued from p. XIX.*)

solid piece of metal. This form of construction is said to positively pervent any chance of vibration.



In these days of power machinery one is likely to forget that in some places there are schools which are not equipped with a power plant. It therefore becomes necessary for manufacturers to provide for the needs under such conditions, and to this end the Millers Falls Co. has just put their No. 417 Lathe on the market. The heavy drive wheel shown in the above illustration is a valuable feature, as it greatly increases the range of work over what can be done on lighter lathes. It is adapted to woodworking and light metals, and is sold at moderate cost, thus meeting the need where appropriations will not allow the purchase of more expensive lathes.

The Smith & Hemenway Company have added chisels to their well known "Red Devil" line of tools. They are made of pure Swedish analysis steel blade, welded to solid sockets of Norway iron that will properly take any handle, and the handles fit the socket without any trimming. Each chisel is accompanied by a signed bond of insurance agreeing to replace within two years from date when first used.

Progressive teachers are always interested in knowing the literature of their respective fields, and in this issue John Wiley & Sons, D. C. Heath & Company, and Rand McNally & Com-

(*Continued on p. XXII.*)

Dietzgen Instruments

—the proper aids for correct drawings—
are quality instruments in quality cases—



the perfect combination.

Send for catalog today.

Eugene Dietzgen Co.

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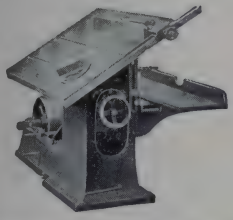
Chicago New York San Francisco New Orleans
Toronto Pittsburg Philadelphia



Crescent Wood Working Machinery



is so very satisfactory in those Schools that have adopted it as standard equipment, that you should carefully investigate the line before you select on the wood working machinery for your School. Ask for catalog giving complete description, and telling about our line of band saws, saw tables, jointers, borers, planers, planers and matchers, disk-grinders, hollow chisel mortisers, and Universal wood workers.



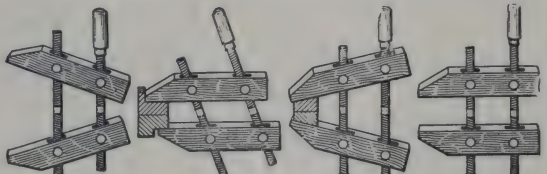


The Crescent Machine Co.,
46 Cherry Street
Leetonia, - - Ohio

"THE JORGENSEN"

The Manual Training instructor wants standard tools to teach with, and also to exercise economy in their purchase. The "JORGENSEN" Peerless Adjustable Hand Screw is adopted by the U. S. Government and all big institutions. Why? Because it is perfect in execution and lasts a life time.

Teach your pupil with the tool he will find in the workshops when through with school. The old style wooden screw rigid tool is obsolete. The "JORGENSEN" is better in every particular.



Manufactured only by the

ADJUSTABLE CLAMP COMPANY

215 NORTH JEFFERSON ST. CHICAGO, ILLINOIS



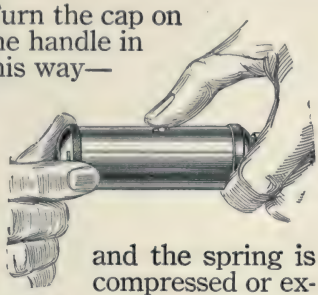
Adjustable Tension!

That's what makes this

"YANKEE" No. 44 Automatic Push Drill

the great saver of drill points — time — trouble.

Turn the cap on the handle in this way—



and the spring is compressed or extended, making the point feed with more or less pressure as needed when working with large or small drills, or in hard or soft woods. Observe that the magazine in the handle holds the drill points upwards — they don't tumble out.



They're made for working efficiency, these clever —

"YANKEE" TOOLS

Make Better Mechanics

Eight **"Yankee"** Drill-points $\frac{1}{16}$ in. to $\frac{1}{4}$ in. supplied in magazine in handle.

"YANKEE" Automatic Drill No. 44, $1.75

Your dealer can supply you.

Write for "'Yankee' Tool Book" for mechanics and handy men, or "'Yankee' Tools in the Garage" for motorists.

NORTH BROS. MFG. CO.
PHILADELPHIA

TRADE NOTES

(*Continued from p. XX.*)

pany are calling attention to books of special interest to teachers of manual training and vocational education. This is especially timely upon the eve of the opening of schools when teachers will be seeking the best helps available.

The development of tools is intimately interwoven with the progress of civilization, and the history of the development of the saw is indeed an interesting chapter. Henry Disston & Sons have just published a little booklet entitled *The Saw in History* that reads like a romance. It traces the history of the saw from the stone age up to the present time, covering practically every type of saw, and is profusely illustrated. The booklet is for free distribution, and manual training teachers could profitably use it as a text. It would lend new dignity to the saw because of its significant history.

The name of Russell Jennings Manufacturing Company has so long been associated with their auger bits that it may not be generally known that their "Percision" line includes also bit braces in all sizes (either plain or ratchet), "Yankee" Push Braces No. 75 X, "Yankee" Spirel Screw Drivers, and Precision Chucks with No. 2 Morse Taper Shank. In any of the foregoing master tools all of the following "Precision" shank tools can be used, giving the widest range of interchangeability: Auger bits, expansive bits, Forstner bits, German gimlet bits, bit extensions, countersinks for wood or metal, and reamers.

In addition to the above line of "Precision" shank tools they are making an excellent line of screwdrivers. The blades are forged of high-grade steel extended thru the handle and terminating in a metal cap. The handles are made of vulcanized fibre, and in view of the construction are practically indestructible.

The "Yankee" tools mentioned above are the well known tools manufactured by North Bros. Manufacturing Company, but fitted with Russell Jennings Fibre Handles and Precision Chucks.

The latest catalog of the South Bend Lathe Works is just off the press. It is well printed, and fully illustrated with half-tones of various

(*Continued on p. XXIV.*)

One Essential Feature of Manual Training Education

is tool education. Knowing how to select and use the right kind of tools. No river can flow higher than its source. No manual work can be better than the tools used for it—with full allowance for variation in skill.

"RED DEVIL" TOOLS

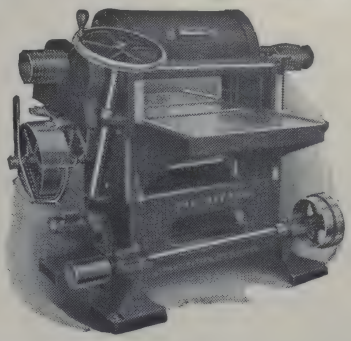
are popular among Manual Training Educators AND STUDENTS because the tools are scientifically designed for practical work and made by men who are proud enough of them to back them WITH AN UNQUALIFIED GUARANTEE.



Write for free booklet.

SMITH & HEMENWAY CO., Inc.
155-157 Chambers Street New York City

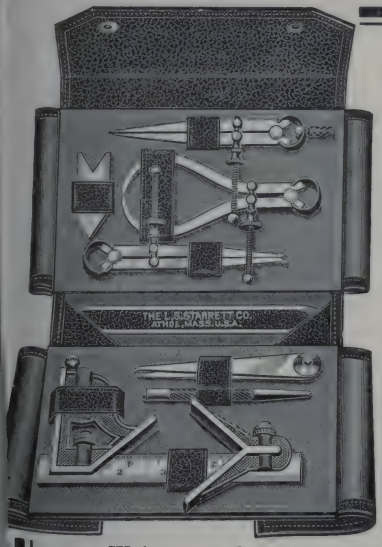
"The Porter" Single Surfacer



Made in 20" and 24" sizes. Well, safe guarded, a strong, well built machine that will do probably all and more work than you have and sells for from $135.00 and up.

We are willing to send you the machine on 30 days trial and if you are not convinced that it is a big bargain for the money, you may return it at our expense.

C. O. Porter Mach. Co.
Grand Rapids, Mich.



The Up-to-Date Vocational Teacher

knows that modern methods of manufacture require the use of measuring tools that are perfectly accurate and at the same time are designed to minimize the time required for reading them. Students will learn the importance of accuracy and efficiency if you give them

STARRETT TOOLS

to work with. You will soon see the pride they take in the accuracy of their measurements and the speed with which they can make them. The set shown is especially for vocational students.

BY INVITATION MEMBER OF

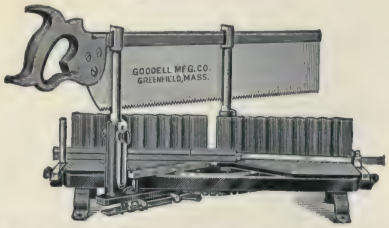
NEW YORK U.S.A.

Write now for our new, free catalog No. 20EF and find out if your tool supply is complete.

The L. S. Starrett Company
THE WORLD'S GREATEST TOOL MAKERS
Athol, - - Mass.

42-364

Save repair expense.
Goodell Mitre Boxes are **ALL STEEL**
They can't break.



GOODELL MFG. CO., Greenfield, Mass.

GOLD
SILVER
SHEET
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TRADE NOTES

(*Continued from p. XXII.*)

kinds of complete lathes, together with the details of construction and use. It also illustrates and describes lathe tools and accessories. This firm has recently issued a revised edition of *How to Run a Lathe* that sells for ten cents. It contains over 190 illustrations and 300 shop kinks. In its original form the booklet circulated widely among manual training teachers. Its publication was a distinct service.



The special feature of the "Yankee" Vise No. 1993, shown in the above illustration, is the swivel base. For bench use the vise is mounted on the swivel base, but it can be quickly detached for use on drill presses, shapers, etc., when desired. The base is easily and firmly locked or released by a short movement of the lever on one side. This vise was recently put on the market by the North Brothers Manufacturing Company, and they will be glad to send descriptive circulars to those interested.

"A Fan for Every Service" is the legend on Bulletin 182E issued by the Buffalo Forge Co. This is a new edition of a previous catalog, devoted exclusively to the different types of direct connected fans for all purposes, among the most important of which are large heating and ventilating units, mechanical draft fans, exhausters for conveying refuse and material, disk ventilating fans, and small electric blowers and exhausters. It shows one of the recent forges equipped with an electric forge blower.

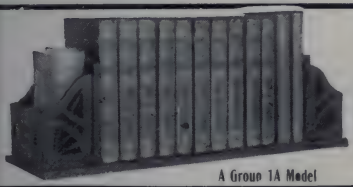
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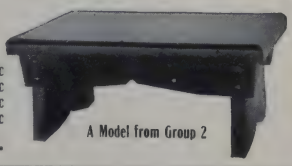


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BOOK NOTES

We think that readers of this column will be glad to see the new emblem adopted by The Manual Arts Press. For that reason we present an enlarged cut of it on this page. The suggestion was taken from a drawing by Walter Crane in his *Line and Form*. The present drawing was made by Eunice Hussey Frazier. It represents art and industry, or if you prefer, drawing and shopwork, meeting at the printing press, the press being at the center of the group.



The two books by Professor Ira S. Griffith, *Woodwork for Secondary Schools* and *Carpentry*, which were announced last spring are nearing completion. The first is expected to be ready for distribution some time during the month of September. This is a textbook for high schools, colleges and industrial schools. It covers the essentials of joinery, woodturning, wood-carving, inlaying, wood finishing, furniture construction and pattern-making as they should be taught in schools of secondary grade. The text is remarkably clear in statement and sufficiently comprehensive. Every reasonable effort has been made to produce a superior textbook. Professor Griffith has been assisted by several experts in special departments, by an experienced photographer and by John R. Frazier who has made for the book a large number of pen drawings of excellent quality. There is every reason to believe that this book will set a new standard in textbooks for advanced classes in woodworking even as the same author's *Essentials of Woodworking* set a standard in textbooks for beginners.

The type in *Essentials of Woodworking*, by Griffith, has been entirely reset and new plates made. Some of the engravings also have been renewed and a few of the drawings re-made. The book is now sold in such quantities as to permit of its being manufactured in much larger editions. This, in turn, has made it possible to reduce the price from $1.00 to 75 cents. *Workshop Note-book*, by Green, has been changed so as to open out flat, thus making it more convenient to use. This, too, is being printed in larger editions and the price has consequently been reduced from 25 cents to 15 cents a copy.

Problems in Farm Woodworking is the title of a new book which will soon be issued by The Manual Arts Press. This book is intended to meet the rapidly growing demand in small high schools, agricultural schools, industrial schools and country schools for shopwork problems that are especially suited to the needs of farm life. This book has been prepared by Samuel A. Blackburn, supervisor of manual training at Dallas, Tex. It is the outcome of several years of experience as teacher of woodworking in a Minnesota high school, where he had short course students in the winter, and spent his summers in helping build barns, houses, etc., in the community. The book will contain drawings of 100 projects ranging all the way from the simplest one-piece problem to a bee-hive, a wagon box, or a bob-sled. The problems are classified as follows:

16 things to be used in the shop (tool carrier, sawhorse, tool chest, etc..)
10 poultry problems (nest, chicken feeder, oats sprouter, etc.)
7 Seed corn problems (testing tray, rack, crate, sled, etc.)
12 yard problems (bird houses, gates, etc.)
10 house problems (fly trap, kitchen sink, etc.)
10 garden problems (tomato trellis, fruit picking ladder, etc.)
5 stock problems (hog trough, unloading chute, etc.)
13 barn-yard problems (wagon box, hay frame, etc.)
3 bee raising problems.
4 concrete forms (for post, silo, etc.)

Each plate of drawings is accompanied by brief explanatory notes and directions. In general, these notes are given under the following headings: (1) purpose, (2) material, (3) bill of stock, (4) tools, (5) directions, (6) assembly. Both author and publisher are sparing no effort to make the book what is needed.

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ESSENTIALS of WOODWORKING

The remarkable sale of this well-known textbook has necessitated larger editions. Larger editions reduce cost and this saving is now passed on to the student. For this edition, the type was recomposed and the printing done from new plates throughout.

Students are greatly benefited and busy teachers relieved of needless work wherever a satisfactory text is used. "Essentials of Woodworking" meets every requirement. It is used by high school and grammar school students in all parts of the United States. It has made definite instruction in woodworking possible, raised the standard of scholarship, enriched courses of study and saved time for both students and teachers. Adopt "Essentials of Woodworking" and let *your* students benefit.

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AFTER HOURS

THE BEST PLACE TO SPEND A VACATION.

EACH year as soon as school is out and the corn-growing weather settles down upon the prairie there is a scattering among the teachers. Robertson goes north to his beloved Minnesota lakes, there to fish and sail and rest and to take a hand in the harvest as he used to do. Brangdon, on the other hand goes south. He takes the first train to the Kentucky foothills. He spends days alone in the mountains, living over his boyhood experiences and letting the



"....the big white clouds...."

grandeur of the scenery feed his soul. It is the only place in the world for him to think as men ought to think on the great problems of life. It is his wilderness. Shelby goes south too, but his goal is the Ozarks. To him the Ozark country combines the best fishing with the best scenery and adds the finest folks on earth. None of the modern restraining devices are needed down there. But Shelby cannot convince Clark, who maintains that there is one section of Iowa that is the best summer place of all for him. He is careful, however, not to include the whole state, and he remarks incidentally that not all of his family agree with him, for his father came from New York state and always longs to go back and end his days on a "York state" farm.

As for myself, I am sure they are all mistaken. There is no place in this broad land quite equal to New England. I like to see the big white clouds roll over those green hills, and then watch the shadows as they steal across the meadow and boldly mount up the hills and disappear in the woods beyond. I like the simple hillside road with spoonwood tangle on the up side and a stony brook on the down side. I like the landmarks that tell of earlier days and remind me of the price paid for freedom and opportunity. But it is useless to explain why I love New England. I was born there. That's the difference.

NEEDED—EYE-OPENERS.

IS it a sign of over-developed imagination or of under-developed power to see that causes us to think the remote more beautiful than the near at hand? We live in Minnesota a half-century and never see the remarkable beauty of the Mississippi river between LaCrosse and St. Paul; we live in Michigan all our lives and never really see Lake St. Clair in all its poetic beauty; we pass the Hudson river and the Catskills on our way to Europe to find beautiful scenery. I have known an artist to think that he could find nothing to paint in America. But I am happy to think that such a day is now past for many. Only yesterday an artist who had just returned from a year in Europe said to me, "Peoria is just as fine a place as Perugia."

In the June number of *The Eye Opener,* a little monthly, published by the Chamber of Commerce of Trenton, N. J., is the kind of an article that ought to be multiplied. It is entitled "Artistic Trenton" and is written by Frank Forrest Frederick, director of the Trenton School of Industrial Arts. He begins by saying, "Anything is artistic if it is the work of an artist or if it furnishes the inspiration for a work of art, or if it appears beautiful to anyone with artistic sensibilities.



"..landmarks..."

"Trenton is an artistic city. * * * She is like no other American city of similar size. Her age, her superb location upon the Delaware, her narrow curved streets, her old buildings, her many canals, her beautiful parks, her educated people, her manufactured products—all set her apart as an artistic city."

After deprecating some "vast and hideous" signboards, one of which is at the railway station, he proceeds as follows: "With the exception of these signs, the way to the capitol is one of interest and artistic character. State Street is narrow, but wide enough for traffic when not obstructed by loafing automobiles. It sweeps through the city in a series of curves, just enough removed from straightness to prevent its entire length from being seen at once and is therefore far more pleasing than the desolate width of the main street of characterless cities. Fortunately, also, the packing-box style of architecture has crept in only in a few instances.

"State Street, between the city hall and the capitol, presents ever-changing effects of light, shade and color. One side or the other is always in shade, with the sky-line of the buildings in shade cutting across the side in light in interesting shadow—the color of the old brick-work growing brilliant or subdued according as it is lighted or shaded. If the early morning light upon the eastern facade of the city hall, with the cool grays of the street's vista beyond, from which raises the semi-sky-scrapers with upper stories also in light, can be surpassed for beauty, it is the late afternoon effect of the setting sun upon the American Mechanic Building rising above the shadowed street and presenting a contrast in warm and cool tones that is marvelous.

"The street is full of artistic surprises. The dome of the State House is never more beautiful than when seen, grouping with the cornice of the Art School, from the Hotel Sterling—a subject for an etcher, and the First Presbyterian church steeple, seen against the warm and cool grays of surrounding buildings, strikes a note of pure beauty that one would have to travel far to see equalled.

"At night the street is perhaps more interesting. Fortunately it is not lighted with the ghastly intensity of the leading street of most cities which have to create an artificial air of prosperity. If it were, the glare would blind the eyes to the beauty of the high buildings towering with the darkness. When the lights are finally extinguished in the Art School, and it is viewed from the opposite corner, it stands in a calm dignity comparable to that of Giotto's Campanile in Florence. The Broad Street Bank building gives something of the same effect—tho this is best on a foggy afternoon when the lighted windows of the hard working lawyers, so often seen late at night, are not so suggestive of the fortunes they are making.

"The man who walks the streets of a city with only the value per foot of the adjacent properties in mind is to be pitied for he misses much pleasure. There may be men who traverse State Street towards the Capitol, whose thoughts are upon matters other than the picturesqueness of this thoroughfare, but they come from other parts of the state, and perhaps cannot be blamed, for a street, like a human face, must be thoroly known and frequently seen and studied under all conditions to be loved.

"Space does not permit an enumeration of all of Trenton's artistic assets. Many of her attractions are so obvious, as the old and new parks, that they are apparent to all, but her numerous canals must not be overlooked. These canals, for several reasons, are a nuisance, but they certainly add to the picturesqueness of the city. They give a quaintness to Trenton that is unusual in American cities, and there are many sections where the reflections of the trees and buildings upon their banks make compositions that are perfect pictures. There is one point on West State Street, where the dome of the Capitol is seen reflected in the canal so beautifully that a subject is provided worthy of the brush of any painter, and on Sanhican Creek, between Calhoun and Willow Streets, are many 'bits' that remind one of Venice, the most picturesque of all cities."

I would be willing to wager that half the people who read the above description will have an impulse to go to Trenton in order to enjoy its beauties, yet the chances are that right in their own towns there are beauties yet unseen by them which would give just as much pleasure if their eyes could be opened. If they went to Trenton, how many of them do you suppose would not be found using *The Eye Opener* description as a guide-book in finding the beauties? And they couldn't find them all in any one day or week, for as Mr. Frederick says, "a street, like a human face, must be thoroly known and frequently seen and studied under all conditions to be loved."

We all need to have our eyes opened to the beauties of our own section of the country.

VOLUME XVII NUMBER 2

MANUAL TRAINING AND VOCATIONAL EDUCATION

OCTOBER, 1915.

AN EXPERIMENT IN HIGH SCHOOL VOCATIONAL GUIDANCE.

CHARLES L. JACOBS.

THE experiment is being conducted in the public high school in San Jose, California. The work however is not called vocational guidance but "life career study."

The difference between our work in this field and that generally done elsewhere and, therefore, the difference in name, is due to the fact that we consider in our discussions of the problem more than merely that aspect of life which is primarily vocational. Out-of-school social-service institutions may concern themselves with vocational possibilities purely, if they will, and most of them do; but the school, if it would fulfill its full obligation, cannot so limit its efforts. It being a social institution in the broader sense of the word, the school must prepare for the coming citizen's life in its entirety. We are, therefore, not content with attempting solely to produce an individual who is able to pull his own oar; we aim to go a step further and provide for that rounded life which alone can make an effective citizen. That further step is called avocational guidance. Under this head we include all suggestions and discussions concerning the most appropriate use of the time not taken up by the daily requirements of one's recognized duties. It is our belief, however, that even guidance into future activities of both a vocational and an avocational nature is not sufficient. There is yet another kind which must be provided, a kind that pertains not to the prospective future activities but to the preparation for these. This preparatory work we, in common with many other advocates of guidance, called educational guidance. It will be seen then that the San Jose high school work in life career consists of three fairly separate divisions.

Naming them in the order in which they might most appropriately be given under the conditions of our present school system; they are educational guidance, vocational guidance, and avocational guidance.

The strength of our conviction as to the importance of having the youth study how his life might be made a success by conscious, intelligent self-direction has resulted in the establishment in the San Jose high school of a Life Career Department. The administrative conditions in this school and, perhaps too, it ought to be admitted, the newness of the work, has prevented us from feeling justified in allotting to the subject as much time as its importance warrants. Tho we feel confident in the worth of our theory, we believe better results will be attained by making haste slowly when it comes to the detailed application. Consequently the present plan is but a suggestion of what we hope the future course will be.

The work of the department, as it is conducted at present, is divided into two subjects, each given in a separate class. Educational guidance, purely as such, makes up the content of one of these subjects, and what we call life career study makes up the content of the other. The latter, with which alone we are concerned here, includes both vocational and avocational guidance. By reason of the limited amount of time assigned to it, the work under this head is mainly of a vocational nature, with merely enough time devoted to the avocational phase to impress the pupils with the importance of giving the leisure part of life its due consideration.

The course in life career study was started two and a half years ago. It was offered to boys only; and only eleventh and twelfth year students were permitted to elect it. Those who took up the work the first semester it was offered received no credit. The first class was consequently somewhat small, but the work proved so satisfactory to both pupils and authorities that from then on it has drawn good sized classes and it has been placed not only on the list of subjects accredited for graduation, but it has also been made acceptable for university entrance requirements.

The work of this subject, at present, covers but one semester. It is conducted on a daily lecture and recitation plan. Outside readings and various pieces of work are assigned and reports upon these are made in the class, or handed in in writing. There are four main divisions of the work somewhat distinct from each other; they are, the study of individual aptitude, the discussion of vocational possibilities, the consideration of the elements of success, and the concrete planning of a life career.

THE USE OF QUESTIONNAIRES.

The study of aptitude is made largely by the aid of questionnaires. There are three of these; one designed for the pupil to answer, one for the parents to answer, and the other for the teacher. The questionnaire for the pupil is answered in class. The questions here concern his ambitions, his abilities, his interests, and his characteristics, as he sees them. Each question is presented to the pupil on a separate sheet of paper and is answered without his knowing its special purpose. The object of this method is to prevent the pupil as much as possible from planning a series of answers which he might think would please the advisor. The questionniare which goes to the pupil's teachers, asks for their opinion regarding his school ability, and requests them to record any prominent characteristics or pronounced peculiarities they may have observed. The questionnaire which is sent to the parents inquires as to their ambitions for the boy, his out-of-school activities, non-school interests, and any decided evidences of aptitude displayed at home.

All the answers to these questionnaires are filed away and used as data by the aid of which, together with observations taken thruout the term, the instructor may hope to suggest to each individual pupil with a fair degree of accuracy, the general type of vocation which would most likely prove satisfactory to him, and which would also make him the most efficient citizen for one of his possibilities and limitations. The same data suggest, also, the avocational concomitant which, for the particular pupil, would be expected to counterbalance the narrowing and confining tendencies of the work recommended for him.

This questionnaire and observation method of determining aptitude, it must be admitted, is crude even in the hands of the best guides. Yet it is felt that even so unsatisfactory a method is far better than none; and until such scientific tests as can be relied upon are at hand and sufficient time is allowed for properly giving them, we must content ourselves with some such rough and ready method as is here described.

A teacher-determined career is rarely acceptable to the adolescent. In order, therefore, to aid the pupil in putting himself intelligently into the work of deciding upon a promising career, he is advised, among other things, as to the vocational possibilities which promise a good future for the youth of to-day. These possibilities are disclosed to the student by a study, first, of the numerical importance of the more general divisions of gainful occupations in the United States, then a more detailed study of the most important of such occupations in the state, and lastly a closer

study of those occupations which are of primary interest to the particular locality. The constancy and growth of these occupations as shown by the reports of the United States Census Bureau is next explained; and, lastly, the main classes of occupations which high school pupils are likely to enter are discussed as completely as the time allotted to this phase of the work will permit. In each case, the present status and future outlook of the vocation, the nature of its duties, the abilities required in its pursuit, the preparation necessary before assuming its practice, the opportunities for advancement within its scope, and the material and spiritual rewards attending success in the field are definitely considered. In this connection the pupils are also made acquainted with the most serviceable ways of finding out for themselves the favorable and objectionable features in any given field. It is hoped by this means to prepare the pupils for making changes which may become necessary in after life, upon an intelligent basis.

To assist the pupil in acquiring ability to determine the vocation most desirable for a person of his gifts and failings, and also to show how progress in one's vocation may be made, the pupils are set to the task of acquainting themselves with the elements which contribute most generally to the making of a successful career. This is accomplished not by a study of any list of these elements, but by a less direct tho more profitable inductive method. The pupils are led to discover the elements of success thru their readings of selected biographies, and further thru their interviews with prominent men of the locality who have distinguished themselves by the success they have attained in their respective vocational field.

When the semester's work is nearing its close, each pupil is required, with the aid of the instructor, to select for special consideration, a vocation which for the time being, all things considered, seems best for him under his exising circumstances; and with this as a provisional goal, he is asked to construct a plan of life. The limits of the present article prevent an extended explanation of just what this part of the work includes. It must suffice here to state that this culminating requirement is accounted one of the most valuable features of the life career study course. It acquaints the pupil with the way in which a career, intelligently selected, may be definitely planned, tho because of the many uncertainties of life, the plan can be only provisional; and it shows him, in addition, how the manner of progressing and succeeding in it may be consciously outlined.

EXPERIMENT YIELDS PROMISING RESULTS.

During the two and a half years the author has been conducting this work, he has found it a most inspiring task. The students have invariably shown an absorbing interest, and many of them who have graduated and have already entered upon the grind of the work-a-day world have come back to tell how helpful the work in life career study has already proven. It is the author's conviction that this work in the San Jose high school has come to stay, and that as it grows in concreteness it will be allotted the proportion of time its importance justifies.

With the vision, therefore, of a four-years course in life career work before him, the author has planned in prospect an extended course which is given in the high school "Bulletin of Courses and Information" after the statement of the existing work, as follows:

> Eventually it is proposed to have a four-semesters, and later on, perhaps a four-years course in Life Career Study. The first half of the work it is proposed to devote to what might be called School Career Study, and the other half to what might similarly be called Vocational Career Study. The School Career Study will include instruction and training in such matters as will lead to greater efficiency during school life and will aid the pupil in planning his course of work to make it more effective as a preparation for his future career. The Vocational Career Study will aim to set before the pupil such facts as should lead him to a surer and more rapid success in his chosen field. It is planned to make the School Career Study compulsory and the Vocational Career Study optional. As the avocational phase of a life career is bound up both with the school aspect and the vocational aspect of life, the question of a desirable avocation will receive its due share of consideration in both phases of the work.

The vision of a completer course in life career study is already on the road to realization. To the original limits of the work there has been added recently an introduction to the work of educational guidance. During the first semester of last year, for the purpose of trying it out, every pupil of the tenth year was obliged to devote an hour a day for one month to the educational guidance course. During the last semester the same work was given to all ninth year pupils. And now that the educational guidance has proven its worth, it is to be included in the requirements of all ninth year students of the future. With that advance consumated, it may be safe to conclude that, provided our present progressive school administration continues, it will be but a matter of a comparatively brief space of time before the entire proposal will have been put into full operation.

HOW TO ORGANIZE A CONTINUATION SCHOOL.

R. W. TARBELL.

THE advent of the continuation school in our present system of education brings new problems for the school man, which take him outside the four walls of the classroom. The older, well established graded and high schools occupy themselves quite largely with teaching those pupils who have been prepared step by step to enter a particular class, and who have few, if any, outside responsibilities. The continuation school must meet a large number of people already at work, must find the proper class for each, and must give instruction suitable and satisfactory to all. The director of the continuation school must also, due to the nature of the program, be in touch with the industries, must plan with them, and constantly keep in mind that factories, shops, and stores now have interests in common with the school.

At the present time men with teaching experience, as well as those coming directly from the industries, are being called upon to organize industrial schools, suitable to the needs of their different localities. It may be of interest to those confronted with work of this kind to know how others have attacked the problems arising.

Let us consider a typical city of 25,000 people, having a variety of industries, a mixed population, and where a continuation school is to be a new school ought first to acquaint himself quite thoroly with the law, and its provisions, for upon him will rest very largely the responsibility of deciding what activities may properly be undertaken. The appropriation for the first year's work should be considered with an idea of apportioning it to different specific uses. It is desirable to confine the work to a few lines at the start.

GETTING IN TOUCH WITH THE INDUSTRIES.

Having gained a working knowledge of the new field, the various industries of the town are visited in order to become acquainted with the employers. Since the continuation school law probably has a part-time schooling clause, for boys and girls at work, it is essential that employers of these children be approached in due time, and in the right manner. A preliminary visit should be made to each one of these

concerns, at which time the law may be explained, information obtained as to number of children employed, and general plans talked over. The employer probably cannot make definite arrangements at this time concerning attendance at school. He will need a few days to partially reorganize his plant. The absence of several boys and girls from each department, for one day each week, will require adjustments in each factory.

Having obtained a list of the prospective students in the industries of the city, some time will be required to work out a schedule of classes, seeing that classrooms are in order, and preparing as much as possible for the first pupils on the opening day of school. A second visit may be made to the shops, and the class schedules completed.

The cooperation of the employer should be sought at all times. His wants must be considered, and where he desires a change in schedule, it should be granted as far as possible. Reports of pupils' attendance, work, deportment, etc., are welcomed by the employer, and will strengthen his approval of the school, as well as have a good moral effect upon the child.

All problems are not settled when final arrangements are made, and school has begun. A great variation in intelligence is noticeable at once. Children range in scholarship attainments from the fifth grade on up into the high school. It is difficult at the start to have all pupils of fifth grade ability in one class, the sixth graders in another, and so on, because of the effort to cooperate with the employer in selections for classes, and it is not likely that the first schedule can be made to coincide with one that seems desirable after meeting the classes. However, some readjustments can be made satisfactorily.

PROBLEMS OF POLICY AND METHOD.

Are pupils of this kind to be taught by class instruction or as individuals?; where should the work begin?; and how is each one to be kept busy? Perhaps the best scheme to follow is to have a series of progressive lessons, and to permit each pupil to start according to his ability, and to permit progress to depend on individual effort. This can apply to almost any lines of work taught to boys or girls. Some class work should take the form of discussions and recitations, so that the child may learn to think and talk in public, as well as to solve a problem silently.

In general, the teacher must decide quite largely, with suggestions from employers, what subjects are to be included in the course of study.

THE ALL-DAY SCHOOL.

If the law requires unemployed children of a certain age to attend continuation school, they can pursue somewhat the same course of study at the start, as the part-time children. Changes can be made later. A school for this group of pupils is more difficult to develop than the department for the workers, because the working child knows the employer is keeping watch, but the unemployed child is answerable to no one, except his parents, and may not attend unless compelled.

It is better not to start the all-day school for unemployed children, until the part-time school is running smoothly. There should be definite arrangements with the truancy department to enforce attendance at school, if necessary. The pupils attending every day should, as far as possible, be separated in their classes from the part-time students. This will be found more satisfactory for various reasons.

If the law requires apprentices learning a definite trade to attend school part time, and the instruction to be directly in line with their work, the instruction must be worked out according to the particular needs of the trade.

EVENING CLASSES.

Doubtless the law under consideration provides for evening schools for adults. This is a broad field. Attendance at these classes is voluntary, and yet strict regulations are necessary. Experience has proved that enthusiasm runs high at the beginning of evening school, in the fall. Some people are over-anxious to learn, and will enroll in too many courses. The principal must be discreet in deciding such cases. Some will soon tire of evening school when the novelty of it wears away, and will begin to drop out. This has a demoralizing effect upon the whole class. The laws usually make these schools free, so that no tuition fee can be charged. However, a deposit fee of one dollar, or more, may be charged, with the understanding that it be returned at the completion of the year, providing the pupil's attendance is satisfactory.

The subjects offered in the night classes will be very largely decided by the demands of those enrolling for work, so that one community may differ quite a little from another. The night school should not run more than eight months of the year, in most cases, as students begin to tire when warm weather comes. It is not advisable to have any one class meet more than two nights per week.

RECORDS AND REPORTS.

Another very important feature which the principal must keep in mind from the start, is the matter of records. This work should not be allowed to go to the end of the year with the expectation that all the necessary information can be gathered when wanted. Records are required for the state, or city, or both, in the form of annual reports. The principal must keep an account of expenses, which means installing an adequate system of bookkeeping. All these things must be planned at the first of the year. Filing and card systems are useful, and these should be carefully revised as new items arise in the experience of the organization.

Since the school is new, the public, and especially employers, will look to the principal for a proper understanding of new features in its development. He should keep the public informed from time to time, by bulletins thru the mail, or in the local papers, concerning its growth. Along with these matters of records, he should lay before the school board at its meetings, definite plans for new activities. The principal should feel the responsibility of planning all the school work.

It will be impossible to do everything well the first year. If the general scheme of organization can be put into good working order by the close of school, the principal should be gratified with results. Courses of study can be perfected, and improvements made as time goes on. Directors should not be afraid to try new ideas. The path is new, there are few precedents to follow, and changes should be made whenever advisable.

THE YOUNG MAN WHO IS A MASTER OF THESE TWO ESSENTIALS OF TRAINING—THE COMMON SCHOOL AND THE SKILLED TRADE—AND IS CLEAN AND RESPECTABLE IN HIS MORAL AND RELIGIOUS LIFE IS FITTED FOR A PLACE AMONG THE WORLD'S GENUINE NOBILITY.—William A. McKeever.

CRAFTSMANSHIP IN EDUCATION.[1]

JAMES FREDERICK HOPKINS.

I WAS thinking as I came down tonight just what would be the best way to approach this particular assignment, and there came home a memory of a meeting of your club at the Franklin Union not very long ago. There you were discussing one afternoon a tentative report which had been prepared, and concerning which some members present that afternoon ventured the sentiment that it was altogether pessimistic in its character. That it started out with an apology was true, and then went on in a tone which hinted that possibly there might be people in the world who would not see that manual training and craftsmanship in education stood for all that we feel it represents.

With this congenial gathering here, representing as I am told by the president, only about one-third of your membership, it seems to me that there can never be reason for apology whatsoever, and there need not be in any future reports or other publication. If a body of workers as representative as this is can come together so regularly with tonight's spirit behind it, it is fair to assume without question, and, I believe, to say so before all the world and at all times, that craftsmanship in education has done something and has accomplished much. You and your associates thruout the country have vitalized education, and have probably done more than any other single interest to bring the activities of outside life into the classroom.

We have all been interested in this thing that has so completely revolutionized the whole educational body—the educational schemes and the work in the schools from one end of the country to the other. Here is something in education that could not have been in the general schemes today if bodies of men of this character, working individually and working as collective forces, had not made the whole proposition what it is. And it seems that under these conditions a meeting like this could not help but bring home to each and every worker that spirit of individualism to uphold and dare to face the proposition as he has never done before with a feeling that a great work is possible, that a great work is under way, that a great work exists.

[1]From stenographers notes of address before the Boston Manual Training Club, December, 1914.

We are not simply interested in the petty questions of this program or that individual exercise, or even this or that part of the year's work. We are in business for something bigger, broader, and better. We are trying to help our boys and girls forward on a straight highway. We are a few of an army of men and women interested in the things that we strive for and that our society is interested in. Our problem is the developing of manhood and womanhood, and I believe I can safely lay it at the door of manual training that it has been giving life and this vitalizing spirit to education. Thru it we have learned to value the definite helpful things that are decidedly clear; with its purposes in our hearts we may meet every claim without question; and from this night, with its cheerful enthusiasm and right good feeling, there shall develop an assured belief that we are a part of education that is making good.

Craftsmanship in education can be touched upon from so many sides. It can be made, indeed, "the long, long way" to the great accomplishments of the things which we all love and in which we all are so interested. There are, however, a few things that stand out prominently. In the uplifting of manhood, in the advancing of womanhood as we see it today coming forward in our schools, much of which can be laid squarely to our door, are we not justified in asking whether any other circumstances have come forward so well and so happily thru any of the obstacles of the old line of education?

PROPER ESTIMATE OF ONE'S OWN WORK.

If there is anything, first of all, that comes from the course in manual training, from the effort of craftsmanship in education, it is the spirit of modesty. If there is any one thing that is brought home to the boys and girls which commends itself for the future, it is brought about in the spirit of modesty toward accomplishment. After the boy or girl has executed his or her project, after he or she has carried out the problem, after our young people have drifted away from the printed page which was characteristic of the earlier days of father or mother or some of the teachers with whom they have been associated, the boy and girl have respect for what it has cost to bring about that particular thing that is going to live in the race fiber for all future time. That modesty toward the accomplishment is one of the big things of citizenship, and one which counts I feel above all others as coming from this work. This is the spirit that a friend of mine showed

who went into a competition for a soldiers' monument in a distant city. He brought in his model and saw all the other sculptors' models. As he put his model in place on the table he said, "That is the best thing I could do up to half-past twelve on this particular day. Next week I can perhaps do better but this day that represents my best."

That modesty toward accomplishment, so vital in any citizen, man or woman, is brought out under the schemes for craftsmanship in education more broadly and better than from within many other efforts. To take the things as they come and make the most of them is that which counts decidedly in human relationship, in citizenship. So, I believe, in the problems of manual training—in craftsmanship in education—there will come out most decidedly, in addition to modesty concerning definite accomplishment, that spirit and that willingness to go in and take the problem as it is developed and make the most of it with no thought whatsoever except to gain a good, clean piece of craftsmanship well done.

Under the old scheme of education, as we read in the history books, there was more or less the question of what we might call good and bad luck. It seemed sometimes as if the other fellow always came in for the good luck. One man injures his finger and the other scratches his hand. One man goes free and the other develops blood poisoning. One man's work turns out just as he would like to have it and the other man's work seems to turn out badly. A good result comes to one and a bad result to another. Not so the boy or girl determined to develop the right spirit in craftsmanship. He does not question in one way or another this matter of good or bad luck. Rather does he go out definitely in the spirit of earnest initiative for accomplishment and success. Your craftsman student does not wait to have these results materialize, rather does he travel off into the field of earnest endeavor and there accomplishes that which he seeks.

MANUAL TRAINING AND CHOOSING A LIFE WORK.

Another important question influenced by manual training is the choosing of a profession. We who are so full of this spirit, so close to this movement, working with it every day of our school life, seeing the opportunities which boys are having offered to them today, cannot help but wonder what it was in the earlier times that led a person to adopt a vocation. Today it is all made so easy. Schemes are arranged in the grammar grades so an introduction may be offered to the various in-

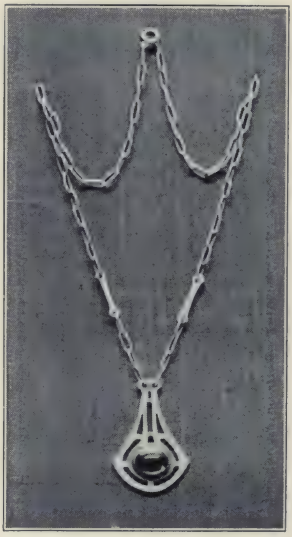
dustries and interests of the era. By and by these things are systematized and handled in such a way that it would seem as if the boy had absolutely no difficulty in making and choosing a profession. That is another thing that you have been bringing about all these years thru this spirit of craftsmanship in education which is here today and which is making education so different, so helpful, so that the bound books are not being looked upon as the only key of heaven as they were once upon a time. This all came about not thru book knowledge, not thru literature, not in mathematics alone, nor in the routine of the old line of education—rather has it resulted from what you stand for, and in the way you are leading the boys and girls into greater opportunities.

Craftsmanship is indeed coming into its own. This uplifting power, this vitalizing of education has not come on the old line work thru public schools, nor on the old lines of education, but it has come thru the fields of industrial art training, which you are representing so happily and which for equality of output must be judged in an entirely different way. You are carrying in more senses than one, that spirit into American life which will vibrate for long thru the messages of the future. Yours is the opportunity to train our youths "to carry the message to Garcia." This spirit of self-reliance, which is everywhere coming forward, is one of the greatest influences that go toward making a man or a woman a success in the world. This is essentially a part of the craftsmanship of today. It is opening up an entirely new point of view. It is turning the things over so squarely that practical men everywhere are demanding the practical point of view. Only a little while ago, we read discussion in the daily papers concerning the changing of the standards of measurement for the men who were to be admitted to the Boston Fire Department from the former height of 5′ 6″, below which height, as you know, a man could not be admitted. Yet someone dared to take the practical point of view that what was really wanted in the Boston Fire Department was a head piece that will carry the fireman into the smother when he is needed and that height was perhaps not so much matter after all.

There are many things coming into our lives which are bound to become more important as time goes on. The manual training worker, manual training movement, and the craftsmanship era have certainly entered into broad development and are utilizing this broader point of view, and they are powerful influences which count for a great deal in developing manhood and womanhood. All these influences have come decidedly out of your classroom; more in many ways out of your class-

rooms than from those academic rooms across the hall. There, for instance, is the spirit of punctuality—how all-important that is. Look back on our own life. How many times have we been held up by the other fellow when we needed to be punctual and definite in work. Punctuality is without question one of the most important things and I feel that with a little thought to details some of these virtues will be seen to have come out of craftsmanship in education. Our training fosters imagination, idealism, and ability to see things in three dimensions, and these are decidedly things which craftsmanship and all that it represents in education will consistently assure.

Many of the cardinal principles which will count in the future in the development of our race may be honestly, definitely, and clearly laid at the door of the craftsman who has been working so earnestly to develop manhood thru hand power and to give a chance for honest accomplishment. For yours is work well done. It is work that has been offering influence and its hopeful, cheering note all thru these years. Yours is the chance to look upward and not down, to move forward with optimism in the certainty of honest accomplishment, for this is craftsmanship in education.



MADE BY STUDENT IN HIGH SCHOOL, PORTLAND, OREGON.

PREPARING TEACHERS FOR GIRLS' TRADE SCHOOLS.

ETHEL M. JOHNSON.

THE needle trades are perhaps the only traditional occupations of women which have held their own since the general field of vocations has been open to both sexes. They still represent one of the most important groups of employment for women, and the solitary trade in which women outnumber men. It is only within recent years, however, that they have been recognized as distinctly skilled occupations, and that definite training has been given to fit girls for self-support thru these trades. Today when the movement for industrial training is at its height, and many of the large cities are establishing separate trade schools for girls, and introducing technical courses in evening and high schools, instruction in the needle arts holds the foremost place. The majority of these schools limit training for girls to millinery and dressmaking, with perhaps machine operating. Practically all give preponderance to these subjects.

In connection with this work there has arisen an urgent demand for competent teachers of the needle arts. An attempt to provide specialized training for such teachers is being made in Massachusetts by the Women's Educational and Industrial Union of Boston, an organization that is one of the leaders in vocational work for women in this country. The present normal courses for teachers of the needle arts are a logical development of the Union's contribution toward securing trade schools for girls in Massachusetts. General industrial classes for women were started by the Union in 1884. They were intended to give housewives greater proficiency in their home sewing, and enable them to make their own hats and gowns. These were succeeded in 1904-5 by definite trade classes for wage earners. The first was a class in hat-making, opened in 1904 "to fit women for the trade of makers of hats," and was a distinct departure from the earlier apprentice system. The same year (1904), the Boston Trade School for Girls was started as a private undertaking. The Union gave hearty support to the plan, and in 1905-06 organized in cooperation with the School two trade shops, handwork and millinery. The school at that time gave only a one-year course, and the Union shops were designed to afford a second year of training under business conditions with normal pay to graduates from the school, thus enabling the girls to enter the industrial field at a living wage. A dressmaking



SAMPLE GARMENTS FROM CHILDREN'S CLOTHING SHOP WHERE NORMAL STUDENTS LEARN ABOUT ORDER WORK AND FINE SEWING.

shop was added in 1910, and later united with the millinery shop. They are now the "Hat and Gown Shop" and the "Handwork" or "Children's Clothing Shop."

With the taking over of the Trade School by the State, and the extension of the course to two years, the need for apprentice training at the Union shops was lessened, and they were placed on a business basis



CHILDREN'S CLOTHING SHOP WHERE THE PROSPECTIVE TEACHERS GET PART OF THEIR PRACTICE TRAINING.

with regular trained employes. The Union's interest in industrial education, however, was only turned in another direction. In 1910-11 the Department of Research undertook an investigation of the conditions of work and opportunity for women in the needle trades: millinery, dressmaking, and machine operation.[1]

STUDYING THE NEEDS OF THE FIELD.

In connection with this a follow-up study was made of the graduates of the Boston Trade School for Girls, including reports of their initial wage and advancement. The investigation showed that while millinery and dressmaking sometimes prove blind alleys for the young girls who

[1]The reports of these investigations are in preparation and will appear in the Union's series: "Studies in Economic Relations of Women."

enter the trade as errand girls, for the girl with ability who has received thoro training they afford a fair chance.

The State Board of Education in 1911 asked the Union to conduct a study[2] of the need and possibility for industrial training for girls and women in the cities of Somerville, Cambridge, and Worcester. As a result of this work, trade schools for girls giving instruction in the needle arts were established in the three cities.

At once the need for industrial teachers to take charge of this work was evident. The household arts schools, and the evening industrial courses for women and girls which have since been started, have emphasized this need. Here, as in other localities, the problem of securing such teachers has proved extremely difficult. The successful trades teacher must be master of two callings: the teaching profession and the trade to be taught. Methods for providing such training have been the subject of extended discussion by educational authorities thruout the country. It is recognized that neither the normal school graduate nor the skilled trades worker is qualified for this position. The successful vocational instructor must combine with academic training and teaching ability, trade experience and a knowledge of the demands of the business world.

The Union in its normal courses for teachers and supervisors of the industrial needle arts is attempting to meet these twofold requirements. The millinery, dressmaking and children's clothing shops at the Union are utilized to afford trade training and experience, and related academic courses are given at Simmons College, which is cooperating with the Union in this work. The first normal classes were started in the fall of 1911. The course covers an academic year, and is open only to women whose maturity and experience give promise of success in this new field. Candidates for the regular course leading to a certificate must have had at least two years of educational training subsequent to the high school, either in college, or in a technical institute or normal school, or they must have had trade experience subsequent to the high school. Other trade workers with adequate experience will be admitted, but no certificate will be granted. Skill in the needle arts is essential for all candidates, as it is impossible within the time limits of the course to give preliminary training.

Obviously trade expertness cannot be acquired within a year. What

[2]Part of this study has been published by the United States Bureau of Education as Bulletin 1913, No. 17, under the title: "A Trade School for Girls."

is attempted, however, is to familiarize the students with the various trade processes, to acquaint them with the conditions and requirements of the trade thru practical experience under actual business conditions. Half of the year is devoted to shopwork under supervision and to practice teaching in industrial schools. Courses in educational psychology and in subjects related to industry supplement the trade training and give the students a broad outlook as to the purpose of their work.

At the college, instruction is given in the needle arts, including plain hand and machine sewing, with special reference to teaching, and in the related subjects, drafting, cutting, fitting, the principles of design and its application to costumes, and the general principles of millinery; also in textiles, color and design, economics, education, hygiene and the conditions in trades and industry.

The academic subjects are taken up in their relation to the trades to be taught. Thus education is presented with special reference to the development of industrial education and to the courses of study best suited to the needs of industrial schools. Economics emphasizes problems that confront the woman in industrial life, as the minimum wage, labor conditions, and labor organizations. The work both at the College and the Union, is under the supervision of the Union's director of practice, who arranges for the trade and teaching experience, and shapes the course to meet the requirements of each student. This individual adjustment is possible since the work is limited to a small group. The program, therefore, varies considerably with the different students. In general, however, it follows the outline shown in the accompanying schedule.

PROGRAM OF TRAINING FOR INDUSTRIAL TEACHING.

This program is divided into four parts:

I. Class work at Simmons College, in the following courses:

a. Sewing, including plain sewing, dressmaking, millinery, with special reference to the methods of teaching.

b. Textiles.

c. Education.

1. Study of the development of industrial education and present conditions in the industries.

2. General methods.

d. Design.

1. Elements of design.

2. Design applied to costume.

II. Practice in the workshops of the Women's Educational and Industrial Union.

a. Children's clothing.
b. Dressmaking.
c. Millinery.

III. Observation and practice in other shops presenting trades employing girls.

IV. Practice teaching in trade schools or classes.

SCHEDULE OF COURSE FOR TEACHERS OF INDUSTRIAL NEEDLE ARTS GIVEN BY THE WOMEN'S EDUCATIONAL AND INDUSTRIAL UNION AND SIMMONS COLLEGE.

ARRANGEMENT OF TIME.

First Semester:

4 Days per week at the College .....28 Hours
1 Day per week in Shop ..... 8 Hours
Subjects:
Sewing .....11 Hours per week
Color and Design ..... 3 Hours per week
Education ..... 2 Hours per week
Textiles ..... 3 Hours per week

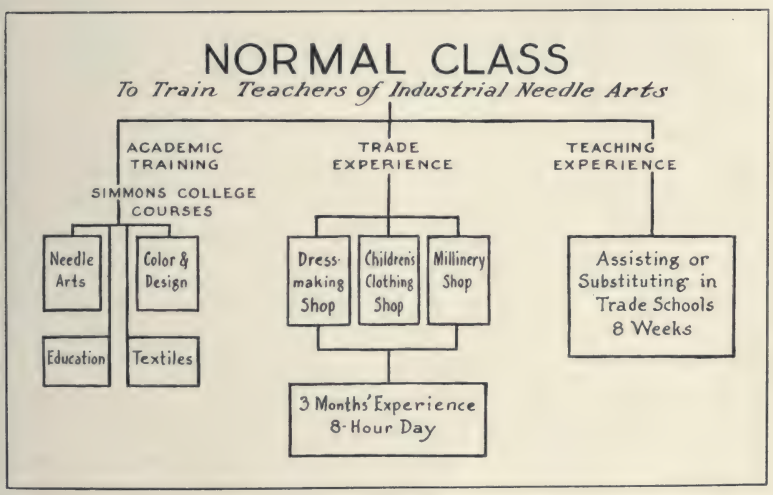
Second Semester:

Education .....2 Hours per week
Textiles (Observation of teaching) .....2 Hours per week
Shopwork ..... 5 Days per week
Practice Teaching in Trade or Industrial Schools.....6 Weeks

The use of the Union's trade shops as laboratories makes possible a method of instruction which could not be applied in the regular commercial house. All of the work is carefully supervised. The forewomen assist the students, giving them an opportunity to learn all the different processes of the work. Thus, in addition to gaining technical proficiency in millinery and dressmaking, they get an insight into the business side of the trade. Beginning with a knowledge of stock and materials, they make sample garments, work on orders, estimate cost of manufacture, and study the necessary bookkeeping. At the same time they learn by actual contact, the requirements of a well organized business. Thru observing the skilled workers, they have an opportunity to gage the speed demands of the trade, and determine what constitutes a fair amount for a day's

work. While in the shops the students conform to all the conditions of the work, coming in at 8:30 in the morning for an eight hour day. Provision is made by the Union for additional business training in other shops representing trades employing girls. Here the prospective teachers are employed as regular paid workers, and placed on the same basis as the other employees. This arrangement has proved extremely valuable to the students in giving them a broader outlook on trade demands.

The course leads to a certificate from Simmons College. Graduates are holding such positions as teacher of trade training in a private industrial school, of sewing and millinery in a technical high school, of domestic arts in a high school, and supervisor of evening sewing courses in a trade school. A significant feature of the course is that it is attracting teachers who have had practical experience in the needle arts, and women expert in the trade, who wish to take up industrial teaching as a profession. The work is in its initial stages, and is still something of an experiment, but one that is being watched with interest by educators thruout the State.



A TECHNICAL SCHOOL IN CHINA.

FRANK A. FOSTER.

JUST when the awakening to the necessity of technical education first came to China would be difficult to clearly state, but the need must have been recognized somewhat before the Boxer Uprising of 1900 by some of the more astute and advanced statesmen like the late Li Hung Chang, the late Chang Chih Tung and the present able president of the new Chinese Republic, Yuan Shih Kai.

Since that time, which may be likened to the first real wakening of the "Sleeping Giant," there has been a rapid growth of the idea, and several technical schools have been founded for the purpose of preparing men for the great tasks of building up the nation on a strong economic basis.

The magnitude of the task is comparable to the magnitude of the country. There are the old conditions, old ideals, and traditions to overcome which require time and patience to change. Progress, however, is being made all along the line and will begin to show important results in some directions before long.

The great work of reconstruction, with its enormous problems of finance, hampers the carrying out of many desired educational plans, as yet, on any very large scale, but the educationists are already considering plans and systematizing methods for a broad, national system of education to be expanded as conditions improve.

Among the first attempts by the Chinese Imperial Government at training men along modern, technical lines was the establishment, in 1905, of the Tangshan Engineering and Mining College by the Imperial Railways of China. In May of that year instructions were received by the Directors of the Railways, Yuan Shih-Kai and Hu Yen-mei, to draw up plans for an engineering college to be established at some point along the railway line, where Chinese engineers might be trained for service on the railways. In August of the same year, Tangshan, a town on the railway line, situated half way between Tientsin and Shanhaikwan, was decided on as the place where the college was to be built. The presence of the railway shops in Tangshan offered unusual opportunities to the students for practice in connection with their engineering edu-

cation. Buildings were completed and ready for the reception of students in August, 1906. Regular exercises did not begin, however, until March, 1907, when the students were divided into two sections of 60 members each.

During the first two years of the College's existence, the classes were handicapped by lack of equipment for practical work, but greater emphasis has since been laid on practical laboratory work in connection with lectures and text-book instruction, and in 1909 additional laboratory apparatus and equipment were acquired. To provide the advanced classes with more room for practical work, a large workshop and engineering laboratories building was constructed. In this building a



FIG. 1. EAST HALL, TANGSHAN ENGINEERING COLLEGE.

mechanical laboratory, a hydraulics laboratory, workshops, calorimetry room, power house, boiler house, electrical engineering laboratory, photometric room and heat laboratory were provided.

The old Chinese conception of a scholar did not include anything in the nature of manual work or of athletic training, which seem such an essential part of "western learning." When modern methods of surveying were first taken up the actual working operations of making a survey, such as chaining, carrying a rod or transit, seemed to the students so much like "coolies' work" that it was difficult to get them to do it. As for shopwork, it was asking them too much, in their estimation, to require them actually to do such work, although they were quite willing to stand by and watch a machinist or fitter do it.

This old idea had, therefore, to be overcome, and new ideals substituted. This was rather a difficult and delicate thing to do, especially with a naturally proud and conservative people. At first it was neccessary to actually pay students to attend such a school. Gradually, as

technical and industrial innovations began to be required in the remodeling of the country, especially in government works, like railways, the possibilities of advancement became apparent, furnishing incentives for the young men to become efficient in the various fields of engineering. At the present time there is no difficulty in getting plenty of bright students to take up technical and engineering studies who are willing to pay tuition for it instead of being paid. They do not even have the



FIG. 2. START OF A RACE IN FRONT OF THE LIBRARY.

old aversion to going into the workshop or field and getting their hands soiled by doing the actual labor. They seem to respond quite readily to the "lure of producing something useful or ornamental."

There have been several factors which have helped to make this change possible. The abolition of the old competitive, literary examinations for entrance into government work opened the way for new ideals to enter. Under the old regime the only qualifications for entering government service were of a purely literary nature. This was followed up by the government's appointment of skilled and trained technical men to important positions on many new provincial and national engineering works, presenting new incentives to the younger men. The field for their usefulness is continually broadening and already extends far beyond the limits of government work.

Another strong influence which has stimulated Chinese students in China, has been that of the returned students who have attended technical schools in America. These students invariably return here with a great

love for the school life and experiences they have enjoyed, and they bring back an enthusiasm for their work which they could not have acquired at home. This enthusiasm is easily caught by the home students, and its influence is for their good.

There is a more marked difference among the Chinese technical students as to adaptability, than among the average students in America. This may be explained, perhaps, by the fact that very few of the



FIG. 3. CLASS IN DRAWING.

students who come to Chinese technical schools have the opportunities which average American boys have of seeing industrial opperations and tools being used everywhere. Many of the Chinese students enter their technical course without the least acquaintance by observation or contact with any of the ordinary tools, the most common shop tools and such appliances as screws, bolts, nuts, etc., being strange to them; their names, uses and principles have to be carefully explained.

Instruction on scientific and technical subjects is of necessity given in a foreign language for a two-fold reason:—(a) The Chinese language does not yet contain the necessary scientific and accurate terms required, (b) There is such a great diversity in the language used in different parts of the country that the students would not all be able to understand the instructor. English seems to be the most commonly used language in these schools where students come from different provinces.

Preparation in English is, therefore, a prime requisite for entrance into the government technical schools, and such preparation is given in many of the lower schools which lead up to a technical course.

Aonther marked advance that is being made in Chinese education is the introduction of athletics. Many of the colleges now have flourishing Athletic Associations, largely due to the influence of returned students from America. Track and field meets are held and competitions among

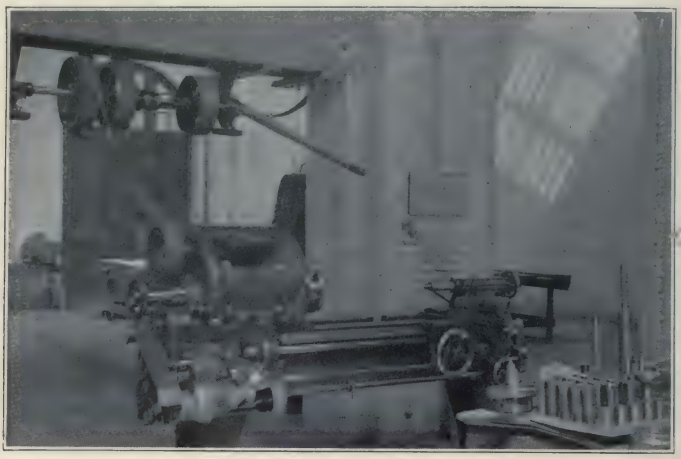


FIG. 4. VIEW IN MACHINE SHOP.

neighboring colleges form a pleasant means of bringing the various student bodies together, and has its reflex action in producing better students than of old. The recent Oriental Olympic contests at Shanghai speaks well for the advance that is being made along these lines for the proper training of Chinese students. On the whole, it can be said that the Chinese students are advancing fast toward the standard of other countries.

The original plan of the Directors-General of the Imperial Railways was for Tangshan Engineering College to train Chinese engineers for railway construction work only, and a course in civil engineering was offered. When the College came under the Ministry of Communications, in 1910, courses in mechanical and electrical engineering were added. The equipment for such courses was, however, very meager and, after the establishment of the Republic, in 1910, they were abandoned because

of a lack of funds. A course in manual training, however, was retained for the benefit of the freshman and sophomore classes.

A good machine shop is provided, but the equipment of machinery is very meager. A notable addition to its equipment this last year has been a fine 16 in. tool-room lathe, Fig. 4, with all the latest fittings and features, made by the Pratt and Whitney Co. of Hartford, Conn. Various small tools have been received from Henry Disston & Sons, Philadelphia, and the American Tap and Die Co., Greenfield, Mass.

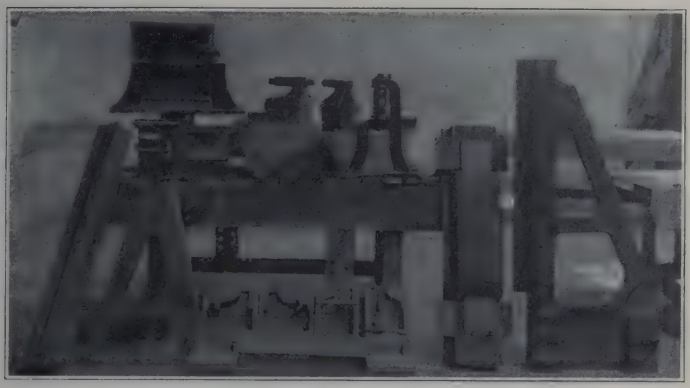


FIG. 5. PATTERNS—PARTS OF A LATHE AND A PLANER.

The instruction in manual training consists in the use of the ordinary hand tools and the turning lathe, which is the only power driven woodworking tool in the shop. Models are made of a variety of timber joints, building construction, the various geometric drawing models, cabinet work and patterns. As machinery is much needed in the shop and there seems little money with which to purchase it, at attempt has been made to make it by preparing the drawings and patterns as part of the students' training, the larger pieces being finished at the railway shops. Fig. 5 shows a group of patterns of parts of a turning lathe and a planer for metals.

An interesting problem in pattern and core-box making has been taken up this year. A new line shaft was needed for the shop, and hangers for it were required. Patterns and core-boxes were made for the hanger, and ring-oiling bearing for a 2 in. shafting, also a pedestal to go in the wall which would carry the same journal bearing as the hanger. Some

countershafts were also needed and various sized pulleys. Patterns and core-boxes were made for all these. Iron body planes were needed, and patterns for the cast parts were made.

The students take great interest in going to the railway shop and watching the moulding and casting of such work as they make patterns for, and have a lot of questions to ask which would not be suggested if they had not had such intimate association with the patterns and their design.



FIG. 6. A CHINESE PORTABLE SAW MILL. SAWING LOGS FOR USE AT THE TANGSHAN ENGINEERING COLLEGE.

Wood is very scarce and expensive in China, owing to the reckless deforestation of the country in times past. The wood used for most purposes except for native house construction in northern China, is either imported from foreign countries or from distant parts of the country. The kinds most commonly used are a few varieties of soft pine and Japanese ash. For pattern work the pine is excellent when properly dried, a condition not easily obtained because there are no drying kilns.

As a rule, lumber is bought in the log and sawed up on the premises where it is to be used. Fig. 6 shows the sawyers sawing up a log into boards to be used at Tangshan Engineering College. The saw has very coarse teeth and for one-half of the length the teeth point in one direction while those on the other half point in an opposite direction. This arrangement permits each man to be sawing at the part of the stroke at which he can pull to the best advantage. The men become very expert in following the lines marked on the log.

To get the lines on the log, it is laid in a horizontal position and "snapped" along the top side and down across the ends with a line which has been drawn through a sponge or cloth wet with black ink. The end lines are usually drawn with a plumb line so as to have the lines on each end parallel. From the first lines others are located and snapped as the work demands. The lines are drawn on the top and bottom so that each man can have a line to saw to. After the lines are marked out, the log is raised at one end so that one man can stand beneath it while the other stands on top.



MADE BY STUDENT IN METALWORKING AT
BRADLEY INSTITUTE, PEORIA, ILL.

EASY WOOD-CARVING

CHARLES A. BENNETT.

I THINK I may be pardoned for being enthusiastic over an experience that was quite like a discovery, and for telling about that experience, in the hope that it may result in a renewed interest in wood-carving as a means of decoration in school shopwork.

For more than twenty years I have been looking for a type of wood-carving possessing merit from the art standpoint and at the same time

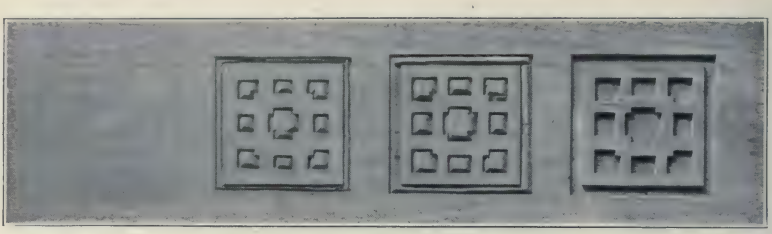


FIG. 1.

easy enough to do to be practical for pupils in the early stages of manual training work in wood. I have believed that in wood-carving and inlaying, but chiefly in wood-carving, the manual training worker should find his best means of decorating wood. But the great difficulty, so far as the carving is concerned, has been in finding a worthy type of carving that did not require too much skill for the young worker or consume too much time in doing.

Going back over the twenty years I recall that I was first attracted by the "indenting and stamping" described by Charles G. Leland in his book entitled "A Manual of Wood-carving." This I soon abandoned because it was entirely inadequate from the art standpoint. Mr. Leland's "gouge work" was better, but involved the use of a tool that was difficult to keep in order and that demanded considerable skill if really satisfactory results were to be obtained. Then came the chip-carving from Sweden and the kerbschnitt from Germany that seemed for a time to solve the problem, but the more one worked with these the more he concluded that the demands for muscular control were severe for the pupils, excepting only the most advanced, and that the

restrictions in the character of the design limited it to a very narrow field.

After these I became interested in the possibilities of adapting some of the simple bold architectural forms used in the Salicis school in Paris. The best of these took the form of interlaced bands, knots and rosettes. In many respects these were satisfactory, but were not quite as simple to produce as I had hoped to find.

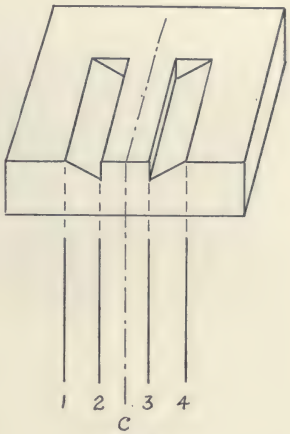


FIG. 2.

The outline and tinting work developed by Enderlin of Mannheim and Richter of Stuttgart are an improvement upon the work of Leland, but from my point of view are not what is wanted. The use of forms developed directly from the tools is suggested in "Wood Carving Design and Workmanship" by George Jack. Some of these are comparatively simple, and decorative. Probably the best published examples of such work are in an article by Professor Leavitt and Miss Clark in the School Arts Magazine for September, 1911. In addition to all of these I have found much satisfaction in the study and adaptation of some of the simpler of the Old Flemish designs, especially the simplest of Gothic tracery.

But none of these seem to me to have as many advantages for the manual training shop as the work that came to me as a new discovery while directing a student, Henry L. Buehren, who had chosen wood-carving as a thesis subject at Bradley Institute. As experimental work in connection with his thesis, Mr. Buehren was asked to show by several series of models the successive steps in carving some very simple patterns. One of the first of these was worked out as shown in Fig. 1. The first step was the drawing, the second, cutting the first chips out, the third, cutting to the lines and the fourth, taking out the background. When this piece of work was shown to me by Mr. Buehren, I became suddenly conscious that the third step in the carving had produced a result that was more pleasing than the fourth. This came as a flash—a new discovery, and it gave me great pleasure because it seemed to possess the same spirit as some of the old mediaeval carvings I had much admired,

and because its simplicity in cutting seemed to indicate that it was just what I had long been hunting for. It seemed to me that in this experimental work we had discovered a kind of carving suitable for manual training school work. As seen in Fig. 1, it consisted of vertical and

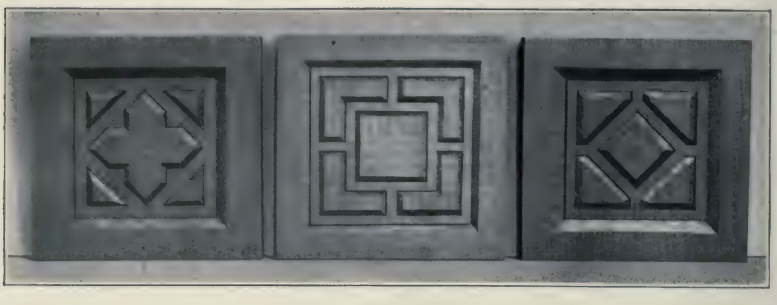


FIG. 3.

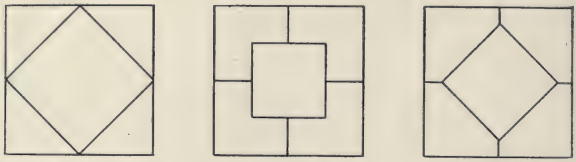


FIG. 4.

slanting cuts with flat chisels. The space between vertical cuts was a raised, flat band, the space between adjoining slopes was a raised background catching the light, breaking it up and making shades and shadows. The background thus became jewel spots of light and dark. We soon foresaw the possibilities of interlacing the bands, thus giving more play of light and shade and the further possibility of introducing curved-line bands, the cutting of which would require only the additional use of a flat gouge.

In the time elapsing since this very simple discovery, results have been attained which seem to justify our early enthusiasm. Not only that, but we have discovered that our discovery was not a discovery at all—that all unconsciously we had merely adapted certain cuts and forms in

Japanese carving to our own manual training needs. In fact I have found that the fundamental cut we used was Lesson 3 in the course at the Tokio University, as presented by Charles Holme in his book (now out of print) entitled "A course of Instruction in Wood-Carving According to the Japanese Method." The revelation of this fact, however, did not cause the least discouragement, but rather added zest to our study. The possibilities of the work grew with each new experiment, and its character changed so much that we could at least call the work American-Japanese if we wanted to do so. Even if the American element in this type of carving was not to be found in the fundamental cuts, it surely was in its adaptation to use in designing and its application as a means of decoration in school shop problems.

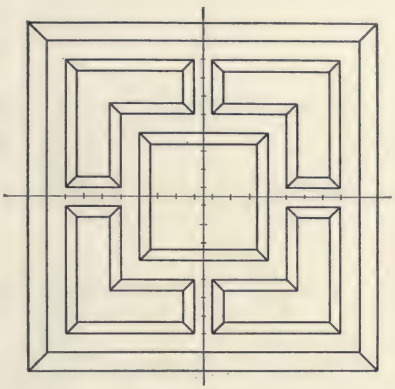


FIG. 5.

An analysis of the work from the design standpoint reveals the fact that in order to produce the fundamental element—the raised band—four parallel lines must always be drawn, Fig. 2. The three spaces between these lines may vary but usually the first and third are equal, and the middle one is wider. In laying out a new design there may be two methods of procedure. One may make the center line, as C in Fig. 2, the basis of procedure. For example, the forms shown in Fig. 3 may be developed by first drawing the simple figures as shown in Fig. 4. If the lines in these figures are regarded as center lines and two parallel lines are drawn each side of these center lines, one easily gets the lines needed in the cutting. One could easily imagine an instrument for drawing these lines as consisting of four pencil points and a guide to run along the center line. After the first sketch of the design has been made one can often make the final drawing more easily and satisfactorily by using a net of crosslines. Fig. 5 suggests how this net can be produced by laying off equal distances on cross center lines and then drawing lines thru each point. In this case the design is 19 units square. The bands were drawn $\frac{5}{16}''$ wide, the bevels $\frac{3}{16}''$ wide, or 3/5 the width of the bands, except the outside bevel which was made a full unit.

The second method of procedure is to make the entire space across the band and the two bevels, or across the four lines in Fig. 2, the basis of procedure. In most practical problems in design this would seem to be the better method because it encourages the development of a design that is suited to the particular space to be decorated. For example, as

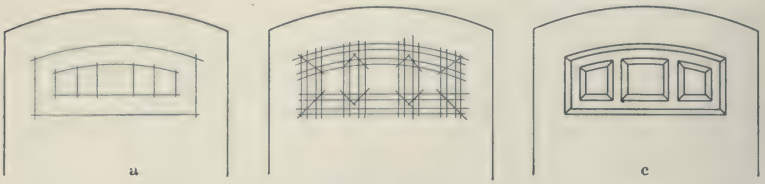


FIG. 6.

in a, Fig. 6, a broad band, which is to include the band and two bevels, is drawn parallel to the contour of the space to be decorated, and at such distance inside as one's knowledge and sense of proportion may dictate. (The contour might readily be somewhat more irregular



FIG. 7.

than that shown in Fig. 6.) Then the space surrounded by this broad band may be broken up with other bands. In a, Fig. 6, two vertical bands break the space. It is in this stage of the designing that the feeling for proportion should be especially exercised by the pupil. Then comes the breaking up of these broad bands, as in b, Fig. 6, and the design is ready to carve, c, Fig. 6.

The carved blocks in Fig. 7 suggest possible forms which may be used in this new type of carving. All three of these designs are drawn

with instruments. The second was adapted from a small design found in a book on historic ornament, the third was copied directly from the book on Japanese carving mentioned above. Fig. 8 is one student's adaptation of the middle design in Fig. 3 to make an oblong spot for the end of his book-rack. These are only a very few of the many possibilities we see in this kind of work.

This article has been written in the hope that it may find interested readers who will be willing to experiment further in adapting its type of carving to school projects.

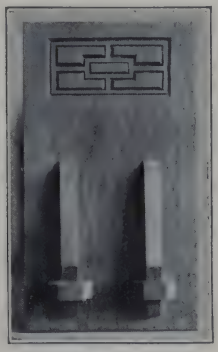


FIG. 8.

INTRODUCTORY PROBLEMS IN MACHINE DRAWING—CONTINUED.[1]

J. CALVIN NICHOLSON.

Before taking up Plate 5, which is the first plate involving arcs, it may be advisable to give the boys a little exercise with the compass and bow instruments on construction problems in geometry. It is questionable, however, whether immature boys who have had no geometry will retain enough of this to make the effort worth while. It seems better to supply these geometrical constructions as the plates themselves really demand them and along with this also to show where trial methods are preferable to actual constructions. Should problems in drawing be grouped about the principles of geometrical construction? or should these principles be sifted into the course in drawing thruout? The latter seems preferable for beginners, though neither alternative can be considered exclusive of the other, and it is the writer's belief that with plenty of time and patience for the task a certain part of a course in very practical drawing could be wisely arranged about the principles of geometrical construction.

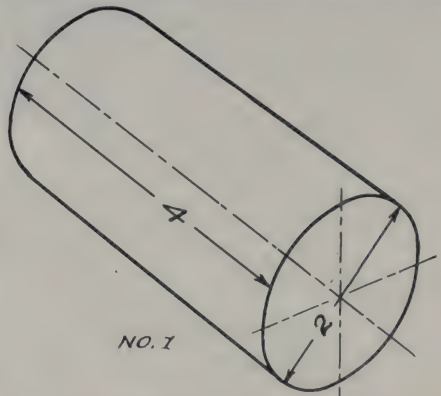
Plate 5 contains four problems, each to be done in a 5″x7″ rectangle. Small objects are here chosen in order to avoid large circles, which are always troublesome for beginners. Some of the problems presented are very difficult to dimension when done so small; as for instance, numbers 7, 8, and 12. This is both an advantage and a defect. If the latter seems to outweigh the former, these objects may be done double size, occupying the entire sheet. Assigned thus they make very good extra problems for the brighter boys.

The good to be derived from Plate 5 depends very largely upon the teacher's selection of problems. The dullest boy should, perhaps, do numbers 1, 2, 4, and 9, though some boys seem incapable of doing the last of these at this point. The brightest may easily do numbers 4, 8, 10, and 12. A good medium selection is numbers 2, 4, 9, and 10. Any one of these selections will bring out the essential principles involved in the plate. It is desirable to have all do problem 4, since it figures in the course later. Boys doing extra plates will profit by number 11, which occupies one-half of the sheet. Problem 14, or some other, may

[1]See article in September number.

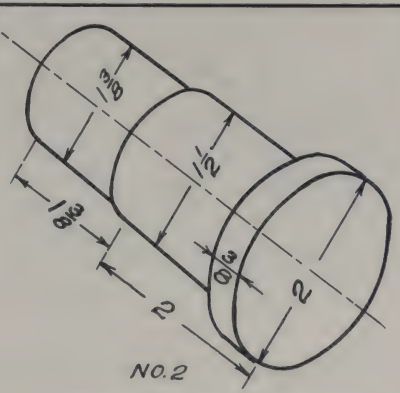
PLATE 5

Divide the sheet into four 5X7 rectangles and in each of these draw two views of one of the following. Choose the two views that most clearly show the object. Notice the new form of line — — — — — marked "center line". The dot in this line should not exceed $\frac{1}{16}$" and the dash generally not exceed $\frac{3}{4}$". Make calculation for views as in preceding plates, then locate and draw the main horizontal and vertical center lines before drawing any part of the object proper. Most measurements should then be made from these center lines to insure accuracy. Consult the instructor freely about putting on dimensions.



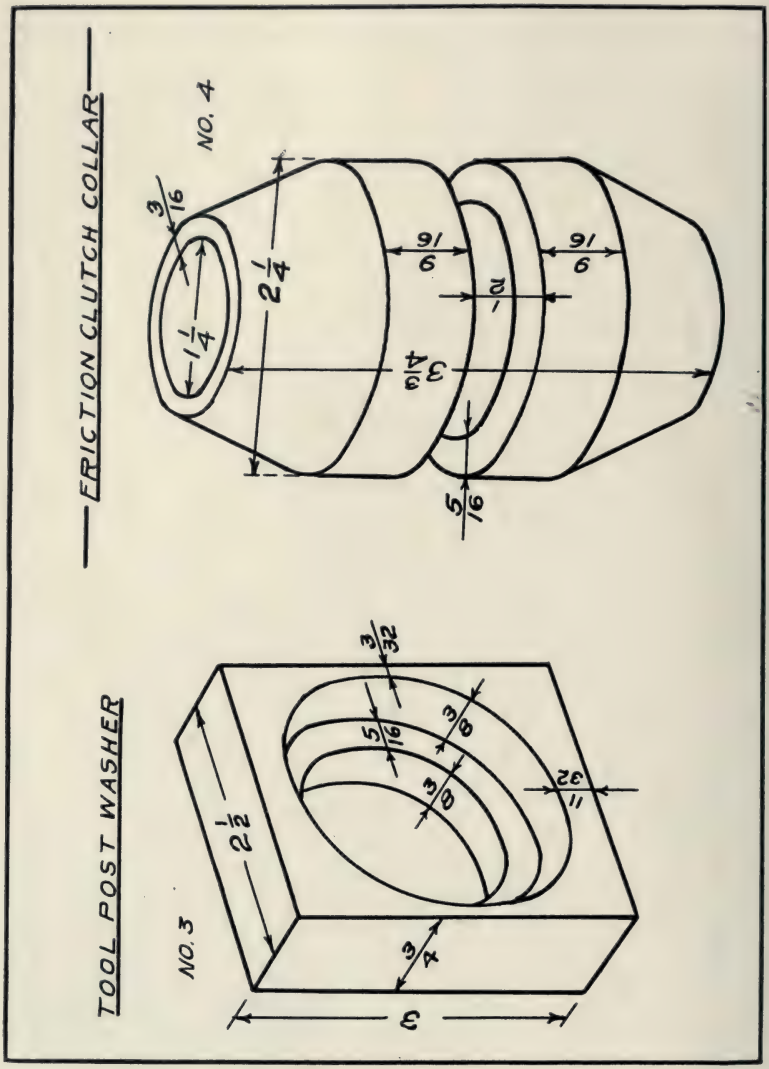
NO. 1

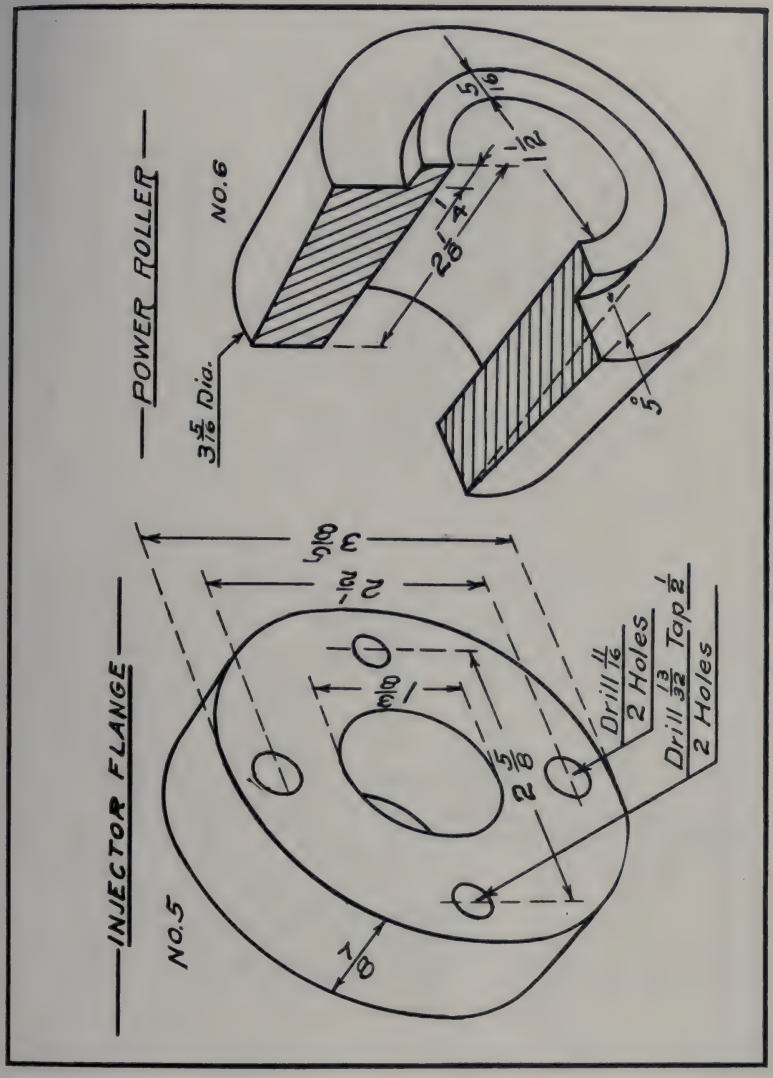
CROSSHEAD PIN

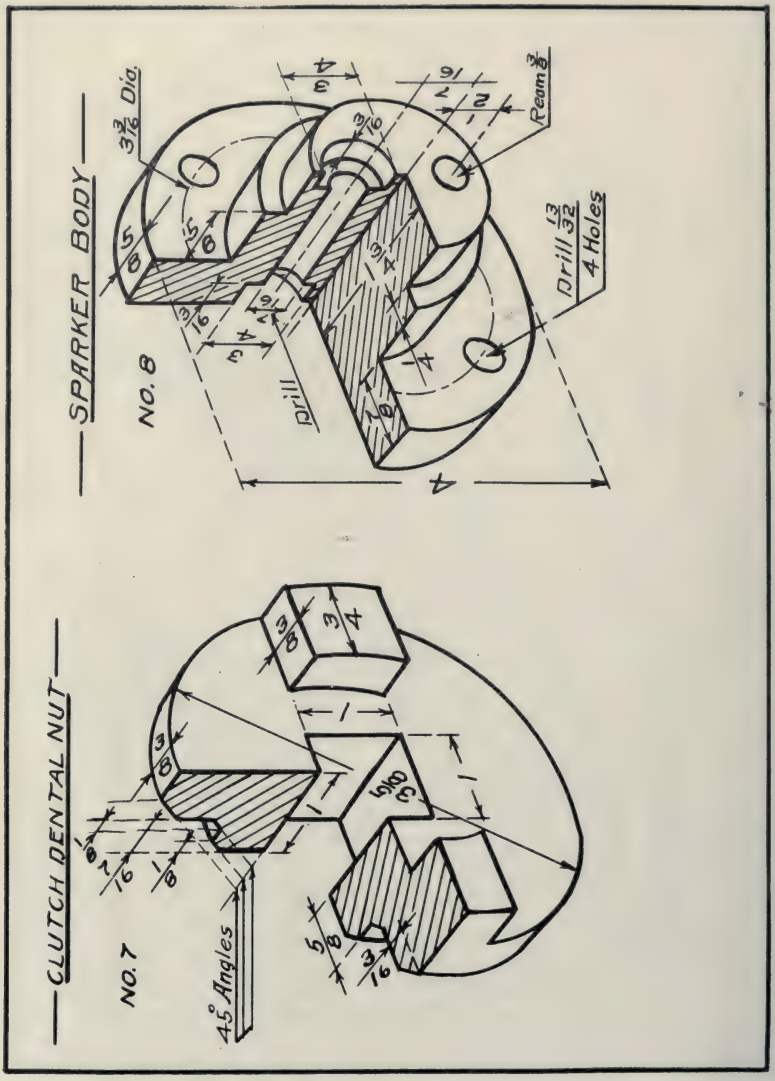


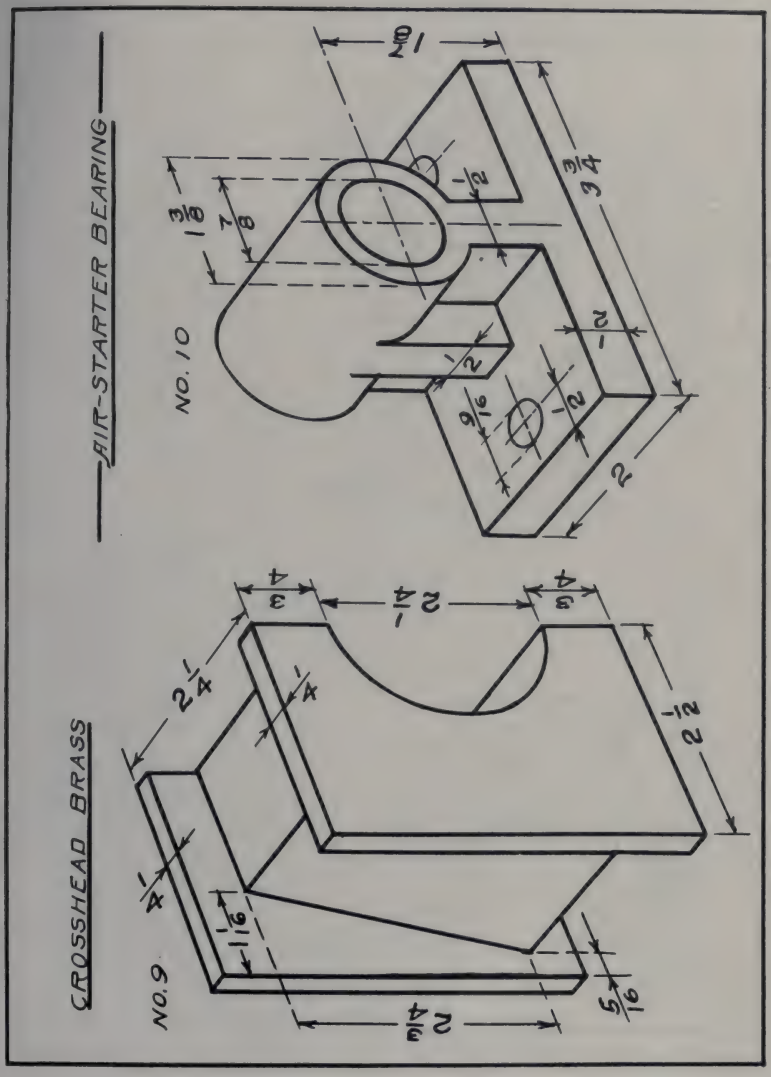
NO. 2

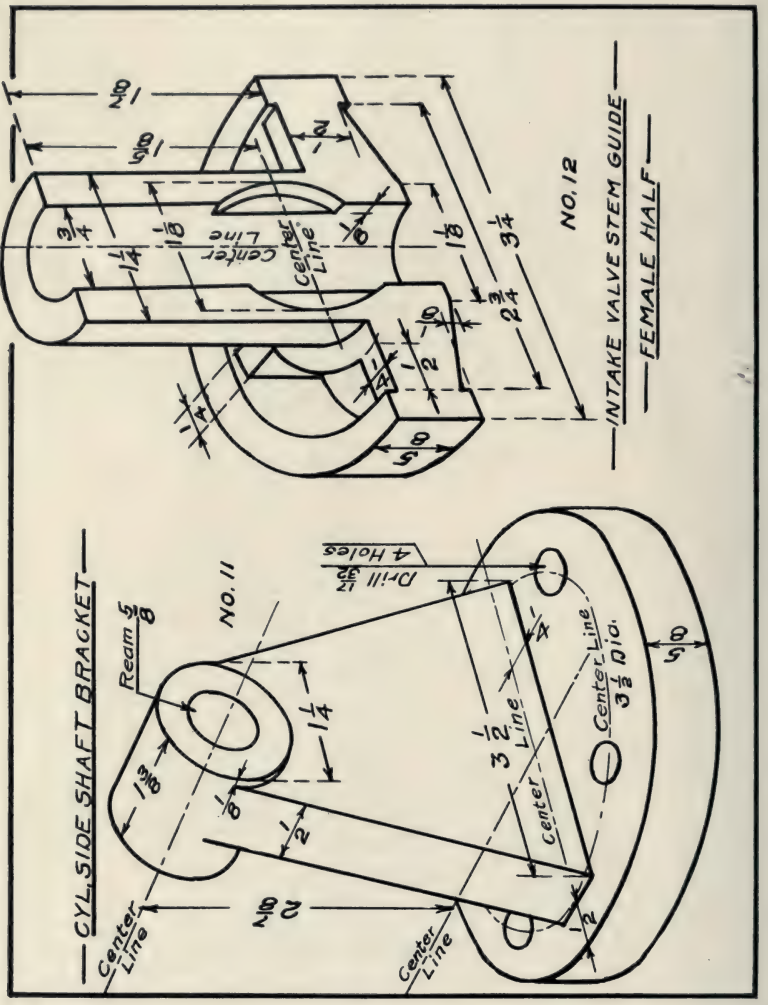
CRANK PIN

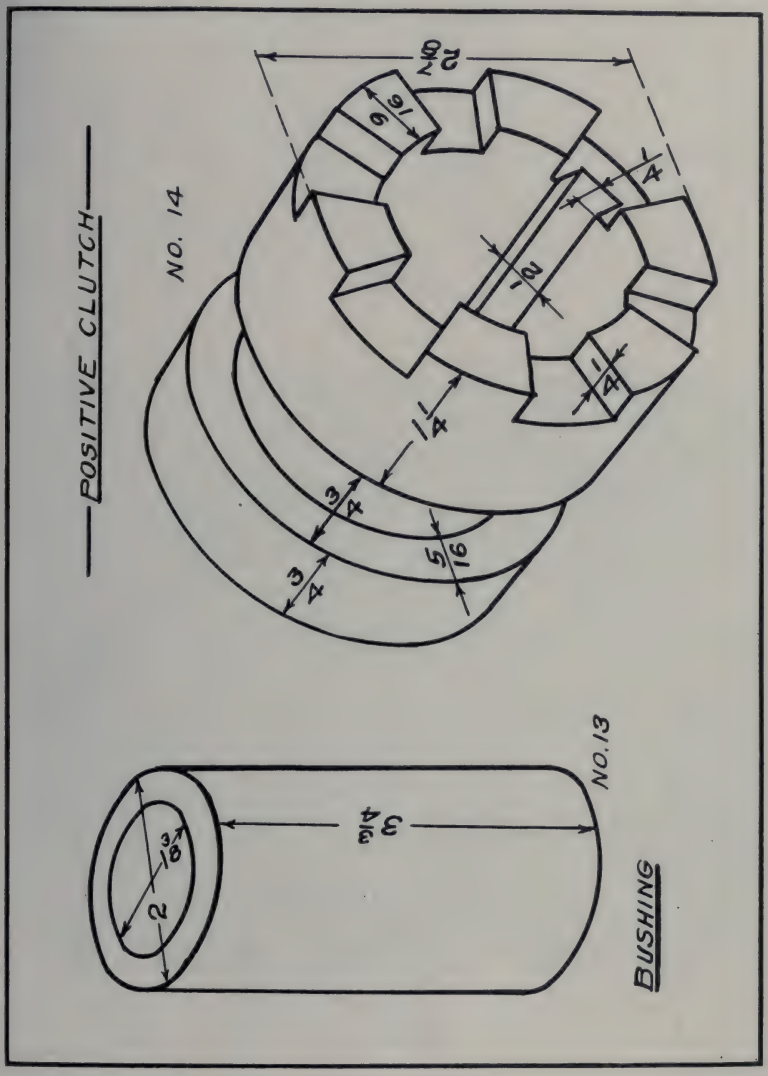

ERICTION CLUTCH COLLAR
NO. 4
3/16
1 1/4
2 1/4
9/16
1/2
9/16
3 3/4
5/16
TOOL POST WASHER
NO. 3
2 1/2
3/32
5/16
3/8
3/8
3/32
3/4
3

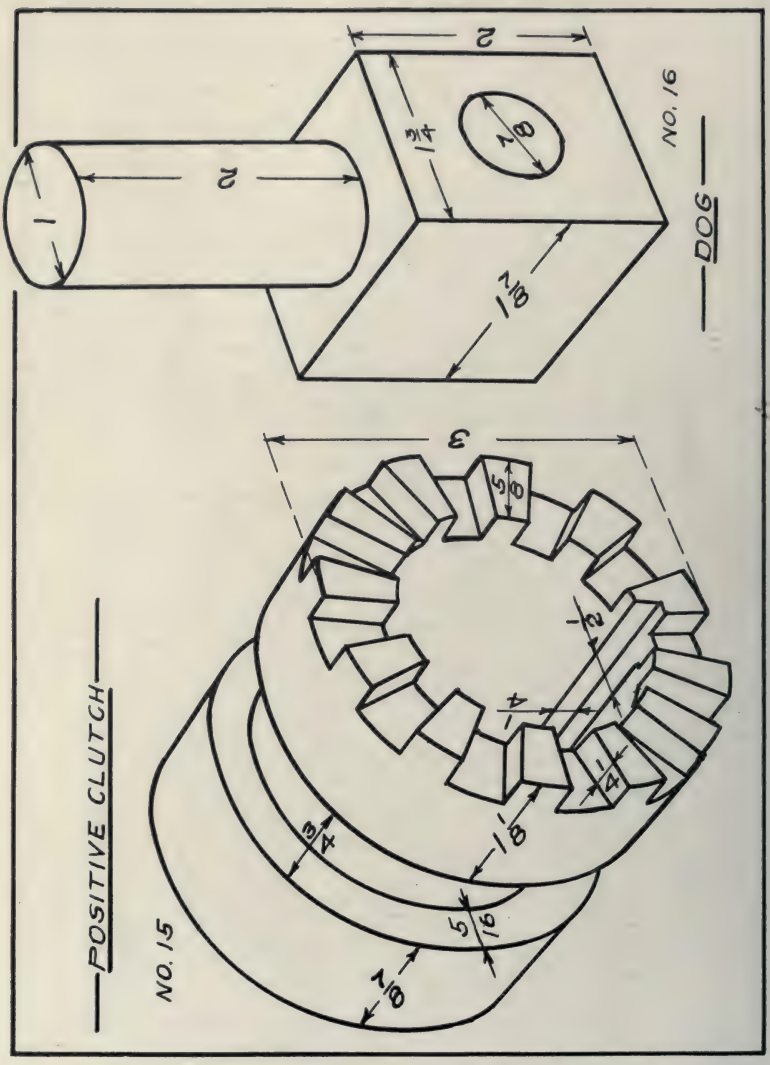

INJECTOR FLANGE
NO.5
POWER ROLLER
NO.6
3 5/16 Dia.
5/16
1/2
1 1/4
2 5/8
5°
3 5/8
2 1/2
1 3/8
2 5/8
1/8
Drill 11/16
2 Holes
Drill 13/32 Tap 1/2
2 Holes


SPARKER BODY
No. 8
3 3/16 Dia.
Drill
Ream 3/8
Drill 13/32
4 Holes
CLUTCH DENTAL NUT
No. 7
45° Angles


AIR-STARTER BEARING
NO. 10
1 1/8
1 3/8
7/8
1/2
3 3/4
1/2
1/2
9/16
1/2
2
CROSSHEAD BRASS
NO. 9
3/4
2 1/4
3/4
2 1/4
1/4
2 1/2
2 1/4
1/4
1 1/16
5/16


INTAKE VALVE STEM GUIDE
FEMALE HALF
NO. 12
CYL. SIDE SHAFT BRACKET
NO. 11
Ream 5/8
Drill 1/2 Dp. 4 Holes
Center Line
Center Line
Center Line
Center Line
Center Line
3 1/2 Dia.
1 1/4
2 3/4
3 1/4
1 1/8
1 3/8
2 Dia.


POSITIVE CLUTCH
NO. 14
2 7/8
9/16
1/4
1 1/2
1/4
1 1/4
3/4
3/4
5/16
BUSHING
NO. 13
3 1/4
3/16
2


2
1 3/4
1/2
1 1/8
DOG
NO. 16
1
2
3
5/8
1/2
1/4
1/4
1 1/8
3/4
5/16
1/8
POSITIVE CLUTCH
NO. 15

fill the other side, tho problem 14 works out better when done double size on an entire sheet to itself.

Nothing in Plate 5 is of greater importance than the significance and utility of center lines, which are here shown for the first time. It goes without saying, of course, that they should be the first lines drawn, that as far as possible measurements should be taken from them, and that these two principles are practically invariable and to be insisted upon in all subsequent work. It is also important just here to make sure that the boys have a clear notion of a plain cylinder and that they *learn to see* that where one view of a cylinder is a circle, the other two views are always rectangles. Half the confusion that arises at this point can be avoided by repeatedly leading pupils to see for themselves why this is true.



ELEMENTARY WOODWORKING SHOP, HIGH SCHOOL, MEMPHIS, TENN., SHOWING LIGHTING FROM TWO SIDES AND ABOVE.

TRADE AGREEMENTS IN THE MINNEAPOLIS VOCATIONAL EDUCATION SURVEY.

MERLE HIGLEY.

THE investigation of industries in Minneapolis to ascertain the teaching content in the trade has resulted in a unique contribution to the administration of industrial education in the country. This has been the formation of a series of trade agreements between employers and employes of five different types, approved by the Minnesota State Federation of Labor, board of education of Minneapolis, the Civic and Commerce Association, the trustees of Dunwoody Institute, and various associations of employers and employes, whereby the trades and industries are to support vocational courses in Dunwoody Institute, the Girls' Vocational High School, and the technical department of the Central High School.

On July 20 the Minnesota State Federation of Labor, at its annual convention in Winona, passed the following resolution:

> Organized labor has not only thruout its entire history supported in every possible way, free education for all, but has repeatedly gone on record in favor of industrial education where carried on under conditions beneficial to the individual worker and not injurious to the trade.
>
> We favor part time and evening classes in such institutions as the public schools and the Dunwoody Institute of Minneapolis, giving further training in the theory and practice of the trade to those who are already employed in it as wage earners. We believe that the courses taught in such part time and evening classes should be such as meet with the approval of both employes and employers in the trade, and should be taught by those who have had successful practical experience in the trade.
>
> Organized labor recognizes that only thru the better education of the youth of the land both in general and trade matters, will the integrity and prosperity of the craft be preserved, and that the success of organized labor must continually rest upon a more intelligent body of workers. We therefore favor industrial schools giving preliminary training for advanced apprenticeship in the trades, but we favor such schools only when they are established under such conditions as insure the selection of boys who desire training for the trades, and are willing to take proper training for it, thorogoing training by competent and experienced instructors, equipment and course of study that are approved by the trade, the placement of the pupils to continue their apprenticeship in the trade in such a way as not to disturb the conditions in the trade, and the withholding of the diploma of the school until the pupil shall have done satisfactory work in the trade.

We believe, further, that most of the training for the trade will be done by the after-training, thru part time and evening classes, of workers already employed in the trade. In order to insure the practicality of all instruction relating to any trade, the school authorities should in each and every case be aided by the advice and assistance of any advisory committee in which the local union for the trade should have representation. We recognize that industrial education has come, and come to stay, and believe that in every community organized labor should take an active part in shaping the policies of all industrial schools and classes in order that the problem may be handled in a constructive way.

Employers support these agreements in several ways. They agree to use the product of courses established under these agreements as their first source of supply for their workers. They also agree in certain cases to take such workers at not less than an established minimum wage. In certain "dull season" trades—painters, plasterers, and plumbers—contractors agree to send apprentices in the trade to school during January and February, five days per week, for the three years of their apprenticeship, paying them one-half their wages during such periods. This payment is to be withheld until the apprentice has completed the course, in order to encourage completion. Fines of loss of one-half a day's pay and a whole day's pay are imposed for excused and unexcused absences of apprentices from classes. Employers further agree to cooperate with schools and trades in standardizing the school and shop experience of the apprentice. Finally, at the end of the year of shop experience, which is the third year of training, they give to the school authorities the necessary recommendation for the issuing of a diploma.

TYPES OF AGREEMENT.

Trade agreements providing for five different types of courses have been completed to date by the Survey. All day classes for two years in school, the first three months of which is a probationary period to test the fitness of the person for the trade, with a third year in the trade, together with evening classes for apprentices and journeymen constitute the type of agreement made with the cabinet-makers, carpenters, and auto repair and mechanics trades.

Another agreement covering "dull season" classes for apprentices during January and February for three years with half pay, and evening classes for journeymen and apprentices, has been completed with the painters, plasterers, and plumbers.

All day classes during two years, with the three-months' probationary period, and part time classes—five hours a week additional instruction—

for a period of ten months during the third year, which is experience in the trade, have been adopted for the printers and machinists trades.

Evening classes for journeymen steam-fitters and bricklayers and their helpers are to be opened. According to the agreement, helpers must attend such classes two nights per week for two seasons of seven months each.

Agreements with garment-makers and department stores provide for two years of day class work, and a third year of experience in the trade at an established minimum wage, with the issuance of a diploma upon the satisfactory completion of that year.

A few beneficial results of these trade agreements may be indicated: The services of advisory committees to cooperate with the school in standardizing the experience of students in these courses will cause these courses to be much more flexible and serviceable to the changing demands placed upon the school and worker. Compulsory attendance of apprentices upon trade courses, and opportunities for free evening instruction afforded to journeymen, will tend to raise the general standard of efficiency in the trade. Finally, it would seem that entrance into industrial employment would acquire a desirable and dignified significance under such conditions as these, and a higher standard for the transition from school to employment would result for worker, school, and employer.



STUDENT WORK, MANUAL ARTS HIGH SCHOOL, LOS ANGELES, CALIFORNIA. DOUGLAS DONALDSON, INSTRUCTOR.

EDITORIAL COMMENT

IT has been reported that in the state of Oregon the demand for industrial tarining is having such a rapid development that the agricultural college has been flooded with letters from teachers seeking what the *Springfield Republican* calls a "first-aid" knowledge of manual training and agriculture. "First-aid" is just the right adjective. We recommend its extensive use. Hundreds, probably thousands, of teachers in schools and industries thruout the country have gained "first-aid knowledge" this past summer, but they are not physicians—not teachers of industrial subjects. The only danger in such a situation is that they may not recognize their own ignorance.

SOMEONE has suggested that in case of war between the United States and a foreign power the manual training and technical schools thruout the country might be an important factor in upholding the country's honor. The shops of these schools could be placed under the supervision of the War Department and used to good advantage in making arms and ammunition. It has been pointed out that there are probably three hundred schools which might render assistance in this way. Abhorrent as the war idea is to most of us, the events of the past few months in Europe would seem to be a warning and a suggestion. Probably somebody will now bring this idea forward as an argument for passing the Federal educational bill.

THE representatives of organized labor in New York City have declared that vocational training in order to be effective should fit the pupils for that branch of trade in which there is the greatest demand for labor. If any other course is adopted in public schools it will meet with the opposition of organized labor on the grounds that it is fitting workers for a trade in which they are not needed, and for that reason is impairing both the earning capacity of the school graduates and of those already engaged in the trade. It is pointed out that this difficulty does not arise in the case of private trade schools because they are automatically regulated by the labor demand. Students will not pay to learn a trade unless there is likely to be a job ahead of them.

In making these statements the labor representatives say that the success or failure of any system of vocational training is determined largely, if not entirely, by conditions outside of the school. If this be true, then the only assurance of success for vocational training lies in cooperation between the schools on the one hand and the laborers and employers on the other. Such cooperation the labor representatives say

they stand ready to give. An advisory committee of employes and employers is suggested which shall advise the Board of Education concerning courses to be taught and the appointment of teachers. It also involves making an occasional survey to determine what are the market conditions of labor in the several trades.

IT is refreshing to feel such a breeze as was started by a high school principal in Pittsburgh a short time ago. As a rule the principals of large academic high schools find it very difficult to adjust their thinking to any change which will break into or get past the long-cherished standards of high school admission, but Dr. Edward Rynearson, principal of the Fifth Avenue High School in Pittsburgh, Pa., has been foresighted and frank enough to say in a recent address before a group of prospective continuation school teachers:

> I believe the high school, to properly meet requirements the taxpayers may justly demand, must provide for the boy from fourteen to sixteen years, irrespective of whether he meets the accepted high school requirements, and regardless of what his previous training has been.
>
> When I say the fourteen or sixteen-year-old boy I mean the adolescent boy. Some provision must be made for him in school, not so much on his standing in his studies, but because he is fourteen to sixteen years old. He must be placed among boys of the same age. He must be looked after irrespective of his qualifications as a student.

An appreciation of the vital importance of this problem on the part of the high school officers generally would mean a more rational, more permanent, and earlier solution of one of the big problems ahead of us in public school work. And its proper solution means the elimination of one of the big problems in vocational education at the present time. In some way these fourteen to sixteen-year-old boys must be treated right. Whether it be in an elementary industrial school or a junior high school or a trade school or in an expanded high school is relatively unimportant. But somewhere, homehow, it must be done in the public school system.

QUALITY BEFORE QUANTITY.

ANY teacher who has thought himself out of the group of high-speed educators who estimate values and successes only in terms of diplomas, degrees and the minimum time required to get them, realizes the truth in what Miss Winchester said in the last report of the United States Commissioner of Education concerning the kindergarten in public education. She says, "The kindergarten's concern is with the content of the years rather than with mere economy of time. Richness

of mental content, power to think and to do, a tendency to assume right attitudes toward life and life relationships, and an ability to work and play happily with one's fellows—these are the results of training based upon the belief in education by development. The true test and measure of the kindergarten must be taken by qualitative standards; the quantitative measure must be merely incidental to the other."

If this were the "true test" of the kindergarten merely, we might not refer to it, but it applies with equal force in industrial education, and, in fact in all other education that is worth while. On a written examination paper we may suppose that all teachers would put quality ahead of quantity when referring to school work, yet when it comes to cutting up subject-matter into school-sized mouth-fulls, arranging school programs, and devising school methods we forget to apply our "quality" ideal. What value is there in getting thru some course, be it ever so strenuous, compared with getting "richness of mental content, power to think and to do, a tendency to assume right attitudes toward life and life relationships, and ability to work and play happily with one's fellows!" In a hundred ways this thought can be applied in industrial education.

Dr. William M. Davidson, superintendent of schools in Pittsburgh, Pa., applied it the other day as follows: "The Pittsburgh of the future must be noted for its perfection of the refined processes of manufacture, rather than simply great tonnage," he said. Then referring to the educational system that will help bring this about he added, "We don't want to encourage any system which produces a man who can make only one thing. Industrial and vocational training must be fused with the most liberal training so that he has no equal in the world."

MODELS AS A MEANS IN TEACHING.

THE writer of an article in the *Technical World* gives an unnecessary, and we think untimely, thrust at manual training schools. He speaks of "a huge model of a house, perhaps ten by twelve feet," which "takes a deal of work to build. It takes skill and patience, and when it is finished, it is not good for anything. Manual training schools have been turning out models of various sorts ever since their inception. But such schools have not been really successful until they dropped that sort of work."

While the general effect of this statement may be good in some cases, it is liable to mislead in others. It evidently is intended to convey the idea that models of things are inferior to the real things themselves as

work problems in industrial education. In general this is true, but the practical teacher can point out cases in which it is not true. In the second place, the statement is intended to give the impression that to make a "huge model of a house" is bad practice in teaching carpentry. This we question. If the author had said "a tiny model of a house" we might have been willing to agree with him. The small model made of material one-fourth or one-eighth the size of that used in a house fails to give real tool experience, but the "huge" model in which full-sized material is used gives real experience so far as tool handling and construction problems are concerned and gives it where the teacher can control conditions far better than on a real house. We would be willing to go so far as to say that a "huge model" constructed in a large room planned for the purpose, such as is now found in many trade schools, gives better training for large classes of beginners than work on a real house which is subject to changes in weather conditions and other distracting influences. We do not claim that the experience in constructing the model is as rich in every respect as that in constructing a real house, but unless the real house can be constructed by small groups of selected students or can be protected from bad weather conditions and other inconveniences, as has been done in the cases where, as at Stout Institute, a complete house is built in the shop building and then moved out, we see no need of crying out against the construction of models, provided full-sized material is used. For the advanced student probably nothing can equal the experience gained in the construction of a real house under the normal working conditions of the trade.

It seems to us to be entirely unnecessary to condemn the good foundation training that many manual training schools have been doing in order to show the value of having the training for those students who have elected to become carpenters consist in the construction of real houses. It seems unnecessary to claim that manual training schools "have not been really successful" until they have dropped all such problems as making "huge" models of houses.

SEEDS OF SIN AND DESTRUCTION?

WE always have respect for the honest doubter. We have been such ourselves on some questions, so we have sympathy. But among honest doubters there may be two classes—the judicial minded and the blind. It is not usually supposed that a university president could be intellectually blind, so we take it for granted that President

Wheeler, of the University of California, was displaying a commendable judicial reserve when he said:

> I am wondering whether this most recent zeal of "vocational training," with all its possibilites of good, may not respond to the spirit of caste and minister to it. As such, it surely bears within it the *seeds of sin and destruction.* Does it propose that the life occupation of a child shall be determined for it early in life? That means that children shall follow mainly the crafts of their parents. It is the old device of monarchial-aristocratic Europe for committing the young to manual and industrial pursuits. It is the old derailing switch which can be relied upon to shunt the children of the laboring classes out into the labor field at the age of twelve, and shut them off from the open road to highest attainment, even tho they have the talent and the will for it. That is not Democracy; it is just the opposite. Democracy is a matter of free opportunity, a fair field, and equal chance.

We like President Wheeler's statement of what democracy should bring to every child—"free opportunity, a fair field, and equal chance." But do the majority of children have an "equal chance" under the prevailing "fair field" and educational system? Surely he would not contend that the child, who for economic or other reasons is forced into a "blind-alley" job as soon as the law will allow him to leave school, has an equal opportunity with the boy who is helped to learn a skilled trade or to go on to the university. Surely he will admit that to help the boy out of the blind alley will help his chances in life. Surely he must admit that to help a boy to avoid getting into a job for which by temperament and capacity he is not fitted is doing that boy a real service and helping his chances in competition with the boy who has by parent or teacher or "big brother" been wisely guided. If he will admit the truth of these three concrete cases his doubts have been dislodged except as they refer to the means of accomplishing the ends for which vocational education is striving. Mistakes have been made in the means employed, but gradually they are being eliminated. We fail to find, either in the means employed or in the forces behind the movement, anything that resembles "the seeds of sin and destruction" as we understand those terms. Instead of being "the old derailing switch," the vocational training movement is the switch that releases the train from the rules of the yard and allows it to go to the town for which it was intended.

IF it be considered appropriate to pursue the matter further, there is one point worthy of mention. In spite of our exercise of more than usual self-control, it is difficult to refrain from calling attention to the circumstance that something besides the judicial mind is displayed in the characterization of any proposed or probable modification of our public

school system as something that "can be relied upon to shunt the children of the laboring classes out into the labor field at the age of twelve." We may pass over certain obvious facts that must be known to the president of a state university, namely, that forty states out of forty-eight have enacted laws forbidding the employment of children under fourteen years of age; that all but three of the states have compulsory school attendance laws, and of these forty-five states all but three require children to attend school at least until fourteen years of age (ten states require school attendance until fifteen years of age, fourteen states until sixteen years of age, and one, Idaho, until eighteen years of age!); and that in practically all modern industry the tendency is progressively toward raising the age at which young men and young women will be admitted as apprentices or learners in jobs that promise much for the future. It seems as if reflection upon these facts might have prevented such utterances as those quoted above.

But what is to be said of the public repetition of such statements in the light of avowed aims and purposes, not to mention achievements? Vocational education is preeminently an attempt to work thru the schools and thru the industries to minister to the educational needs of children who have not been served completely or efficiently by existing schools. It is an attempt to supplement existing educational opportunities, to the end that "all the children of all the people" may be adequately prepared for their life work. Vocational education is as far from being a manifestation of the "caste spirit," and as far from contemplating a "shutting off of boys and girls from the open road to highest attainment", as the strongest hyperbole can express.

We believe that injustice is done by the assumption of noble motives, lofty ideals, and superior insight on the part of educators exclusively, and the ascription of only selfish and so-called "business" motives to the employer as the explanation of his interest in vocational education. As Mr. Alden, president of the Norton Companies, Worcester, Mass., is reported to have said, the representatives of "big business" who are studying the problems of better education for their employes are "men not only of business ability but of high ideals and human motives. The business man of today who leaves these ideals and motives entirely out of consideration has not discerned the signs of the times or the path to his own ultimate success."

Mr. Henderschott, of the New York Edison Company, executive secretary of the National Association of Corporation Schools, is in position to speak authoritatively of the plans and motives of the in-

fluential group of persons whom he represents. In a statement recently made public he says: "We believe the public schools should have entire charge of the child until the age of fourteen or until graduation from the elementary school. . . . Neither do we believe that the child should be taught any trade, or that the child should be shaped to fit into any specific industry, until after graduation from the grammar school." Any one who is familiar with "elimination statistics" knows that the public school is very far from realizing its part of even this modest program of popular education.

In the face of these and similar declarations, those who persist in sounding the alarm against vocational education on the ground of impending oppression of the weak and helpless, may very properly be invited to substitute a bill of particulars for their vague and general charges.

We do not know to what extent the statements of President Wheeler represent the educational thought of California and the Pacific Coast. They do not suggest the quality of leadership for a section so progressive. They are not even consistent with the policy of the University of California itself, so far as policy is reflected in courses offered. That courses in engineering, for example, are of vocational value to those who are privileged to make use of the opportunities is not open to argument. An educational policy that provides vocational courses for the fortunate few who can afford college and university advantages, while deploring as "sinful" the proposal to make corresponding provision for the less favored majority, seems to us more characteristic of what we understand by the "caste spirit" than does vocational education, even at its worst. The point of view suggested by the quotation which has inspired these observations deserves to be characterized not only as restricted and prejudiced in outlook, but reactionary in philosophy, and distinctly patrician in sympathy.

OF CURRENT INTEREST

OPPOSE PUBLIC VOCATIONAL SCHOOLS—FAVOR CONTINUATION SCHOOLS.

The July-August number of *The Apprenticeship Bulletin* published by the School of Printing at the North End Union, Boston, gives an account of a joint conference of employers and union officials in the printing industry held in New York City. The conference was made up of the committee on apprentices of the United Typothetae and the Franklin Clubs of America, on the one hand, and a committee representing the International Typographical Union, on the other. These committees agreed that "trying to teach printing in small plants located in school buildings and operated under scholastic conditions, does not produce the best results" from the trade standpoint, but they also agreed that "the best results are obtained by the continuation work conducted by the schools for the benefit of apprentices employed a part of the time in shopwork under commercial conditions." The following summary is quoted:

> The conference lasted three hours and gave occasion for a very free and full discussion of the fundamental principles of apprentice training. As a result of this discussion, it appeared that the two committees were entirely in accord upon certain fundamental points. This agreement was not reached by a process of argument, but was simply the formulation of opinions held by both committees before the conference began.
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> Briefly stated, it was agreed that any sound system of apprentice training must be founded upon apprenticeship agreements, as necessary to secure and safeguard the best interests of all concerned. The conference was inclined to believe that the period of apprenticeship should be five years. The second point of agreement was, that training for the industry should be carried on in the industry and that we should look to the public schools for aid in the instruction of apprentices on the academic side of their work, giving them a certain amount of instruction weekly in English, shop mathematics, design, and other matters directly bearing upon the industry. It was the opinion of the conference that there are so many evils evident in operation, and practically inevitable, in public vocational industrial schools, that the conference felt that both organizations ought to work strongly for the other type of instruction and discourage the carrying on of public vocational schools of printing wherever possible. It was also agreed that the two organizations ought to work for the extension of continuation school work of the kind just described, and wherever it is introduced both organizations should agree in making it compulsory upon apprentices.
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> The third point of agreement was that better and more definite provision ought to be made in the shops for the instruction of apprentices in shopwork,

recognizing that the haphazard conditions in this regard are very unfortunate and stand in the way of the introduction of a better system.

JUNIOR TECHNICAL SCHOOLS IN AUSTRALIA.

Australia is successfully developing a new type of school which corresponds in some respects, to our junior high school, but perhaps more closely to some of our vocational schools. This new school is called a junior technical school, and has come as a result of the agitation for vocational traning and a study of local conditions. It was observed that many trades and industries have been recruited quite largely from boys who were unsuccessful or unhappy in school and from boys in minor occupations who have been trying to find new jobs. Inspired with the desire to change this condition the Education Department of Victoria in 1912 established in Melbourne the first of a growing number of junior technical schools each covering a two year course outlined as follows:

First year—English, civics, geography, algebra, geometry, mensuration, plane and solid geometry, clay modeling, cardboard modeling, elementary science, woodwork, sheet-metal work, physical culture.

Second year—English, civics, mathematics, science, and a preliminary training in any of the following subjects to lead to higher work in the senior technical school:

Carpentry, cabinet-making, wood-carving, sheet-metal work, plumbing, blacksmithing, turning and fitting, mining engineering, assaying or metallurgy, mechanical engineering, mine management, postal mechanics' work, engineering draftsman, electrical engineering, architectural draftsman, municipal engineering, and technical positions in the state and commercial service.

The new school was an immediate success. In 1913 four more such schools were added in other cities, and now there are seven with an average daily attendance of 1228 boys.

Our information concerning these schools comes from A. E. Tatton, director of the junior technical school in connection with the School of Mines and Industries at Bendigo. After studying the vocational guidance problem Mr. Tatton saw that to organize a department for guiding a boy into a job was only to make a registry office of his school. He recognized that what the youth wants is vocational training. He saw that the kernel in the whole movement for vocational guidance is the need of vocational training; hence the method adopted by him of *guidance for training and not for jobs.* However, the boys from his

school are helped to jobs, for a majority of the business firms in Bendigo already give preference to students from the junior technical school when filling vacancies.

WHAT SEVEN YEARS HAVE DONE.

The Lakeside Press School for Apprentices has recently issued a pamphlet under the above title which is of interest not merely because



THE LAKESIDE PRESS SCHOOLROOM AS NOW ARRANGED.

it is a fine example of modern printing craftsmanship, but because it gives proof of the success of this school. The school for apprentices was organized July 8, 1908, to train competent workmen for the various departments of the Lakeside Press. The school was suggested to the management by an article in a government report describing the school established over fifty years ago by the Chaix Printing Company in Paris.

The school at the Lakeside Press selects thirty grammar school graduates each year early in July from those who have completed their school course. The boys selected must be between fourteen and fifteen

years of age, of good physique, good moral character, show excellent school records, and be desirous of learning the printing trade. The boys chosen are given a fair trial during the pre-apprenticeship course of two years, half time school and half time work, and at sixteen are regularly apprenticed to the department best suited to their ability for a term of years until the trade is learned.

During the entire course the boys are paid for their time, receiving advances every six months during the apprenticeship. The training



THE LAKESIDE PRESS SCHOOL SHOP AS NOW ARRANGED.

begun during the first two years is continued during the course, the boys receiving full pay for the hours spent in school each week.

The course of study includes training in mathematics, English, drawing, design, elementary science, civics, and history, together with a thorough course in the technique of the trade selected.

To the instructor interested in methods of adapting school studies to the needs of industrial workers, and in the adaptation of industrial equipment to school conditions, the following statement from the pamphlet is worthy of special consideration. It has a bearing on several

questions that are constantly under discussion by public school teachers and directors:

At the beginning, the school as equipped differed but little from the ordinary schoolroom. The equipment available for an apprentice school seven years ago was simple, little suited to the purposes of a factory school. No textbooks were available for the special subjects taught, nor were supplies suited to the work on the market. The best materials and texts available were selected and the work of preparing a course of study and compiling suitable texts was begun. Everything prepared has been given a thorough trial, under varying conditions, to determine whether it is suitable for the purpose of the school. The mathematics of printing presents enough material to require a thoro course of training in the subjects. Drawing and design are fundamental subjects in the business, and require years of careful training. English as a study must be mastered, especially the mechanics of the subjects. The history of printing, the manufacture of paper, inks, and other supplies require time and careful study.

The factory school today is a great improvement upon the school of a few years ago. The equipment is suited to the purpose of the school. A course of study that prepares students for a definite line of work is followed. Textbooks have been prepared on applied arithmetic, rules for compositors, design as applied to printing, applied spelling, and a simple course in book-keeping. A library of valuable reference material has been collected, and a system of exchanging samples has been instituted with the leading technical schools of printing of the world. The student of printing needs abundant reference material of the better class, books on the technical subjects connected with the trade, and equipment to try out new processes. These things The School for Apprentices endeavors to provide, and to train the students in their proper use. The teachers of the school are working with the national apprenticeship committee of The United Typothetae of America in arranging a technical library on printing.

When the school was organized the composing-room was arranged as the typical composing-rooms of the day, with long alleys, and with the foreman's desk at one side. No thought was taken of the wasted time spent in traveling to and from the foreman's desk and the proving presses. The material was all of standard size and make, so that no false motions were learned by the beginners. No definite lessons were available for the young compositors, nor were any estimates as to the time necessary to complete a given amount of work available. The best traditions of the printers were available, and, with these as a basis, there has been built up a definite course in composition, which is required of all pre-apprentices. The boy entering the pressrooms or the binderies is required to do the same work in composition as the boy who enters the composing-room. Composition is the foundation of the printing business, and is excellent training preliminary to an apprenticeship in any department of the business.

The composing-room in the school, as arranged after a careful and scientific study of composing-room plans, presents a marked contrast to the first arrangement of the room. The saving in time and the closer supervision that can be given by the better arrangement has increased the efficiency of the students to a marked degree. A series of carefully graded lessons in practical typography

has been prepared by the instructor. These lessons are unique in that they furnish the necessary practice, and at the same time each lesson gives complete instruction in the correct method of doing the work. In connection with the graded lessons commercial work is done, and at all times the standard of The Lakeside Press is maintained in the school. Students soon learn that no inferior work will be accepted and they learn to produce a commercial product. Careful time studies have been taken on the work of the students. Each job has an estimated time for its completion and all standings are time basis records.

VOCATIONAL ART DAY AT SAN FRANCISCO.

Vocational Art day at the San Francisco exposition was July 29th. The name was given to the day on account of the fact that the National Vocational Art and Industrial Federation held its convention on that day. A special feature of the program of this convention was a luncheon at the Inside Inn, arranged for by the San Francisco committee of the Federation. On this occasion Mrs. T. Vernette Morse, honorary life president, acted as chairman, and Calvin H. Brown representing the Panama-Pacific Exposition, presented the Federation with a medal in commendation of its efforts in behalf of industrial art education. In presenting the medal Mr. Brown said:

We are more than pleased to commend an educational movement that is not confined to the school alone, but is sufficiently broad in its scope to include the activities of the home and the business world as correlated educational factors which must be recognized in the development of human ability. This gives to the word "education" a new significance.

It seems to me that the present Exposition is a concrete example of what this federation stands for. It is an example in inspiration, in beauty and in joyous expression of art and science at their best. The first inspiration for an exposition is created through an artistic mind; the constructive plan, the wonderful colorings, the artistic lighting, the complete landscape grounds, the magnificent floral display, each and all assist in creating a concrete picture, as great, if not greater than any that the artist can put upon canvas.

This movement has accomplished a great work in the past. The Exposition honors that work by presenting this medal and hoping that future activities may bring continued success.

In response Mrs. Morse said,

In accepting this medal in commemoration of the work that this movement represents, I wish to do so, not only in the name of those who have for years devoted their time to the cause, but in memory of those who, when we were working for another exposition, almost as great as this, created the ideal which we are today honoring. This movement is the result of ideals formed during the Columbian Exposition by Halsey C. Ives, Daniel H. Burnham, Charles F. Kurtz,

Frank Millett and myself. We were an enthusiastic group, and believed that we saw a new road leading to educational activities that should lead into life itself. Art and science was to lead all humanity along wonderful avenues of development. Let us hope that we are somewhat nearer the goal today than when we started. My co-workers of those days have passed into the Great Beyond, but who among us today does not believe but what their work will go on forever? Others have come into the field. The business men of the country are with us in thought and action.

Delegates appointed by the governors of several states were present, including Connecticut, New Jersey, New York, Pennsylvania, Ohio, Illinois, Minnesota, Oregon and California. An invitation to hold the 1916 convention in Cincinnati was accepted. The officers for 1915 were T. Vernette Morse, honorary life president; Hon. Carroll S. Page, president at large, Washington D. C.; Francis G. Blair, president, Springfield, Ill.; William B. Austin, first vice-president, Chicago, Ill.; Warren B. Hicks, second vice-president, Madison, Wis.; Miss Florence Ellis, third vice-president, Sandusky, Ohio; Arthur Chamberlain, fourth vice-president, San Francisco, Calif.; Miss Susie V. Powell, fifth vice-president, Jackson, Miss.; Mrs. Robert L. McCall, secretary-treasurer, Chicago, Ill.

A CHILDREN'S ART MUSEUM IN BOSTON.

A group of Boston men and women interested in art education and artistic handicraft have formed what is called the Settlements Museum Association, and they propose to establish a "Children's Museum of Art" this fall at the South End, somewhere in the settlement-house district. A building 46 by 13 feet, one story high, with an attractive front has been planned. This is, in fact, only a small section of a much larger structure, with gardens in front and a handicraft shop in the back, which they hope to have in the future.

The museum will contain such works of art as will appeal to children under fourteen years of age. It is expected that it will serve as a sort of preparatory course for the great Museum of Fine Arts. It will develop taste for the beautiful in painting, sculpture, architecture and the handicrafts. As one interested in the project has said, "It has seemed too much of a jump to take children direct to the Museum of Fine Arts."

It is believed that this museum will be heartily welcomed by teachers of drawing and shopwork in the schools of the city and will be much used by them. What libraries in many cities have been doing, in

a degree, this museum will attempt to do adequately. The museum will be conveniently located for thousands of children.

The leading spirit in this movement is FitzRoy Carrington, curator of the print department of the Boston Museum of Fine Arts. He is assisted by John D. Adams of Lincoln House; B. Preston Clark of the Lincoln House council; Huger Elliott, supervisor of educational work, Museum of Fine Arts; Frank Gair Macomber, honorary curator department of Western art; Paul J. Sachs of the Fogg Museum, Harvard University, and Mrs. Catherine E. Saunders, head resident of the South End Music School.

This little museum is to be entirely independent of the Museum of Fine Arts so far as management is concerned, tho it is hoped that the Museum of Fine Arts will loan various groups of objects from time to time.

EXAMINATION QUESTIONS IN ILLINOIS.

The following is the list of questions used in May, 1915, by the Illinois State Examining Board in selecting teachers for county certificates in manual training:

Answers to any eight of questions 1 to 10 may be offered as a minor. Answers to any eight of questions 6 to 15 may be offered as a major.

1. Give order of procedure, with reasons for each step, in planing two edges and two sides of a board to given width and thickness.

2. What is the proper method of sawing and planing, to a given dimension, the ends of the board use in question No. 1? State what cautionary advice you would give the student.

3. What is kiln drying? Why is it done? How does it affect the strength of the materials?

4. Give an outline of a course in elementary bench work, covering seventy-two forty-minute periods.

5. Name the tools necessary for the proper construction of the models in question No. 4, stating which tools you would keep on the bench and which ones in a general tool cabinet.

6. Describe the following joints and give two uses for each:
   Butt joint
   Half-lap
   Mortise-and-tenon
   Mitre joint
   Dovetail

7. Show by sketch and explain your method of construction the following geometrical problems:
   (*a*) To erect a perpendicular at the end of a given line.
   (*b*) To draw a circle thru three given points.
   (*c*) To inscribe a hexagon in a circle.

8. Make a sketch of a foot stool suitable for a shop problem, showing all the views necessary and the required dimensions.

9. Name the different parts of a wood lathe.

10. At what speed would you run a wood lathe when making the roughing cut on a piece of wood 3½"x3½"x10"? What tools would you use?

11. Outline a course in wood-turning covering fifty lessons, one hour and twenty minutes for each lesson. What tools do you think best to provide for this work?



MANUAL TRAINING SCHOOL BUILDING, EVELETH, MINNESOTA.

12. What is a pattern?
What is a draft?
What is a shrinkage?
How much do you allow for shrinkage in cast iron?

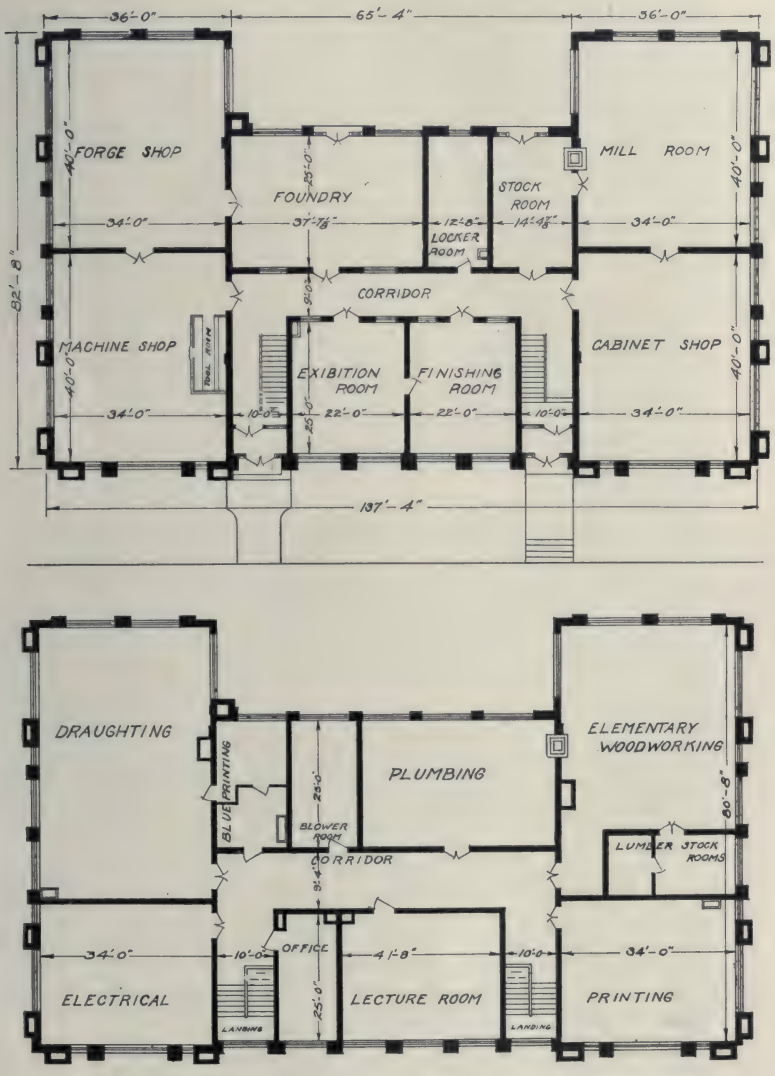
13. What is a green sand core?
What is a dry sand core?
How would you decide which one of these cores to use?

14. Explain the steps necessary in molding a pulley 10" in diameter, 3" face, casting to have a ¾" hole thru hub.

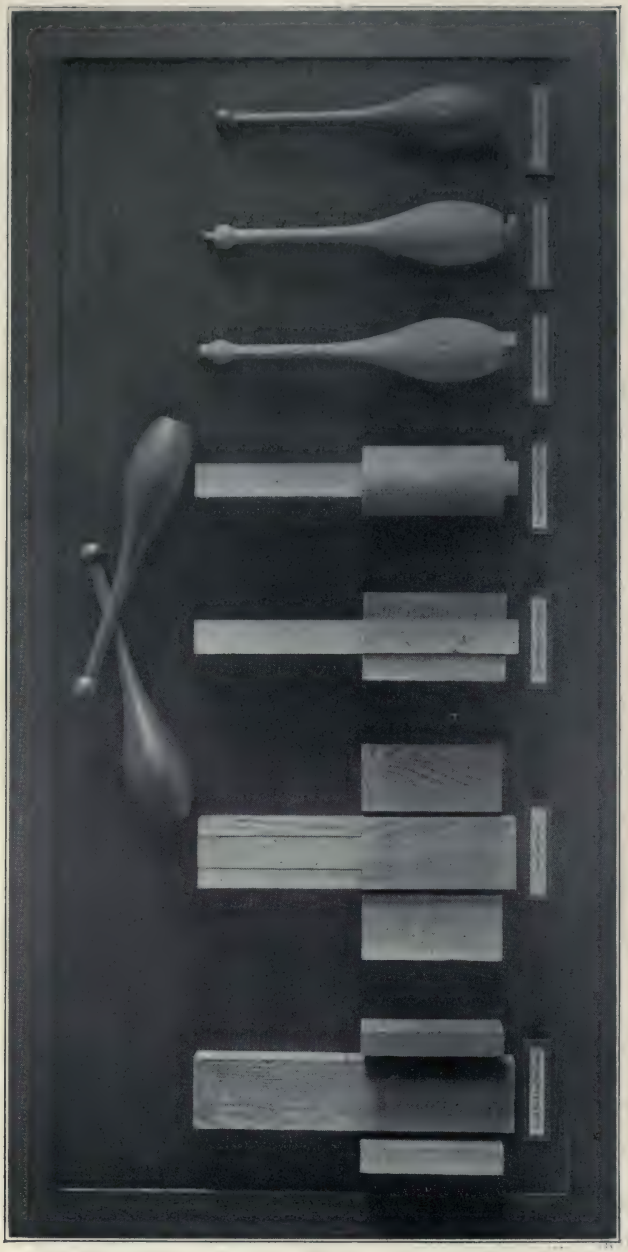
15. How would you explain the principle of welding to a group of students? What do you consider the best material to use for welding? Why? Would you use this material with a class of High School boys?

In Illinois certificates for teaching special subjects are granted to (a) those who give evidence of graduation from a recognized four-years high school and from a two-years approved special course of training which includes satisfactory work in English and principles and methods of teaching besides the special subjects to be taught; (b) those who give evidence of graduation from a recognized four-years high school and "present evidence that they have taught or can teach the special subjects.

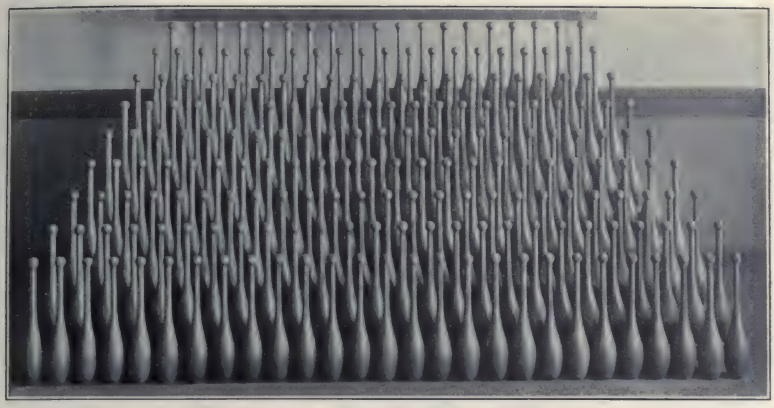
Candidates must pass an examination in English, in principles and methods of teaching, and in the subjects to be taught. The above is an examination given to such candidates. *The examination does not include any actual shopwork.*



FLOOR PLANS OF MANUAL TRAINING SCHOOL, EVELETH, MINNESOTA.



STEPS IN THE PROCESS OF MAKING AN INDIAN CLUB AS DEVELOPED AT THE WILLIAM L. DICKINSON HIGH SCHOOL, JERSEY CITY, NEW JERSEY.



"AS LIKE AS TWO PEAS IN A POD."



INDIAN CLUBS AND INDIAN CLUB MAKING AT THE WILLIAM L. DICKINSON HIGH SCHOOL, JERSEY CITY, NEW JERSEY.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

OFFICE DESK.[1]

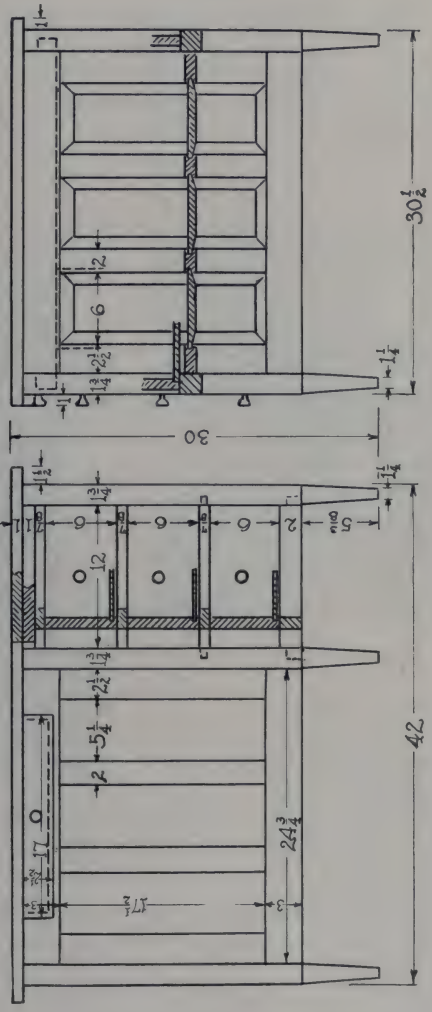
The office desk shown herewith is the plan and work of Milo F. Day. The problem is out of the ordinary because of the design and because of the amount of machine work involved. The panels were raised on the dado by tilting the guide to the proper angle. A cut-off saw or a rip-saw might be used if no dado was at hand. The drawer knobs were fashioned on the lathe. The desk is thoroughly well made and equal in workmanship to any desk of like character that may be purchased of a dealer.



The wood used was quartered oak, and the finish is dark oak polished with hard wax. The material cost $8, and the time required for building was seventy-five hours.

[1]The material in this issue was contributed by Joseph C. Park, director of manual arts in the Oswego, N. Y. State Normal School, and prepared under the direction of James M. Early, an instructor in the department.

OFFICE DESK



SERVING TABLE.

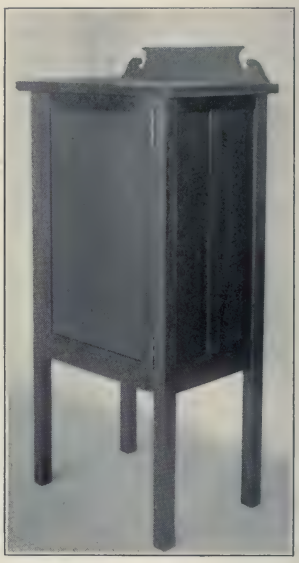
This table was designed and built by Frederick J. Quigley, for a serving table, but may be used as a chafing-dish stand or a small library table.

This is a piece of unusually difficult construction for young men of the high school age, involving as it does, open paneling in intricate position. Each piece is mortised with a shouldered tenon. This table is built of quarter-sawed oak and finished with dark golden oak finish.

The time required to build this table was forty-three lesson periods of forty-five minutes each, and the cost of the material was $4.50.



SERVING TABLE.

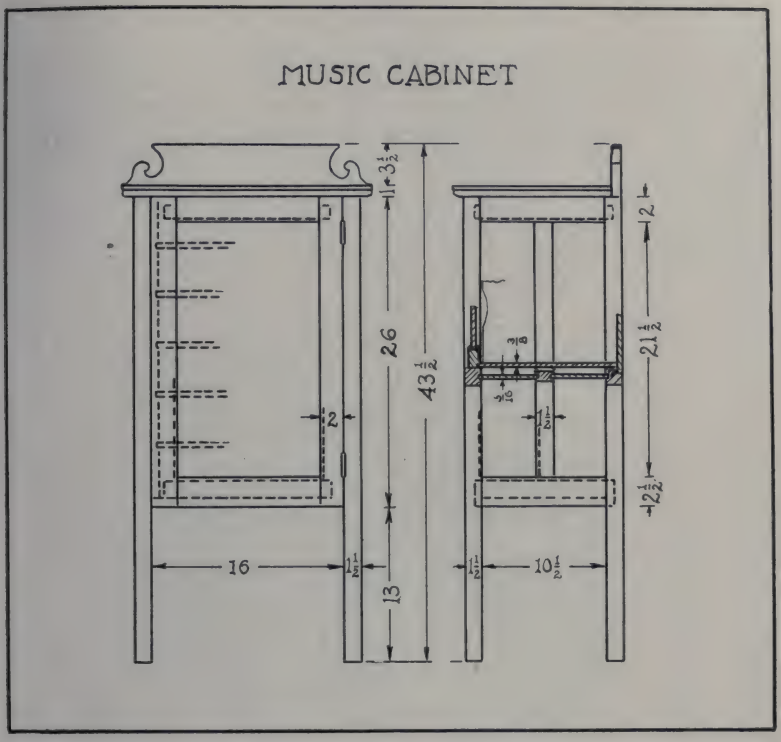


MUSIC CABINET.

MUSIC CABINET.

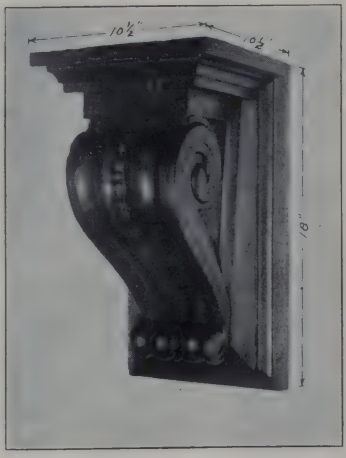
This music cabinet for sheet music was designed and built by Miss Gertrude Lake. The wood of which it is built, except that for the inside work and shelving which is linden, is solid mahogany. The finish is dark mahogany stain, shellac and three coats of varnish. The first two coats of varnish were rubbed with pumice-stone and water, and the last coat was rubbed with pumice-stone and oil.

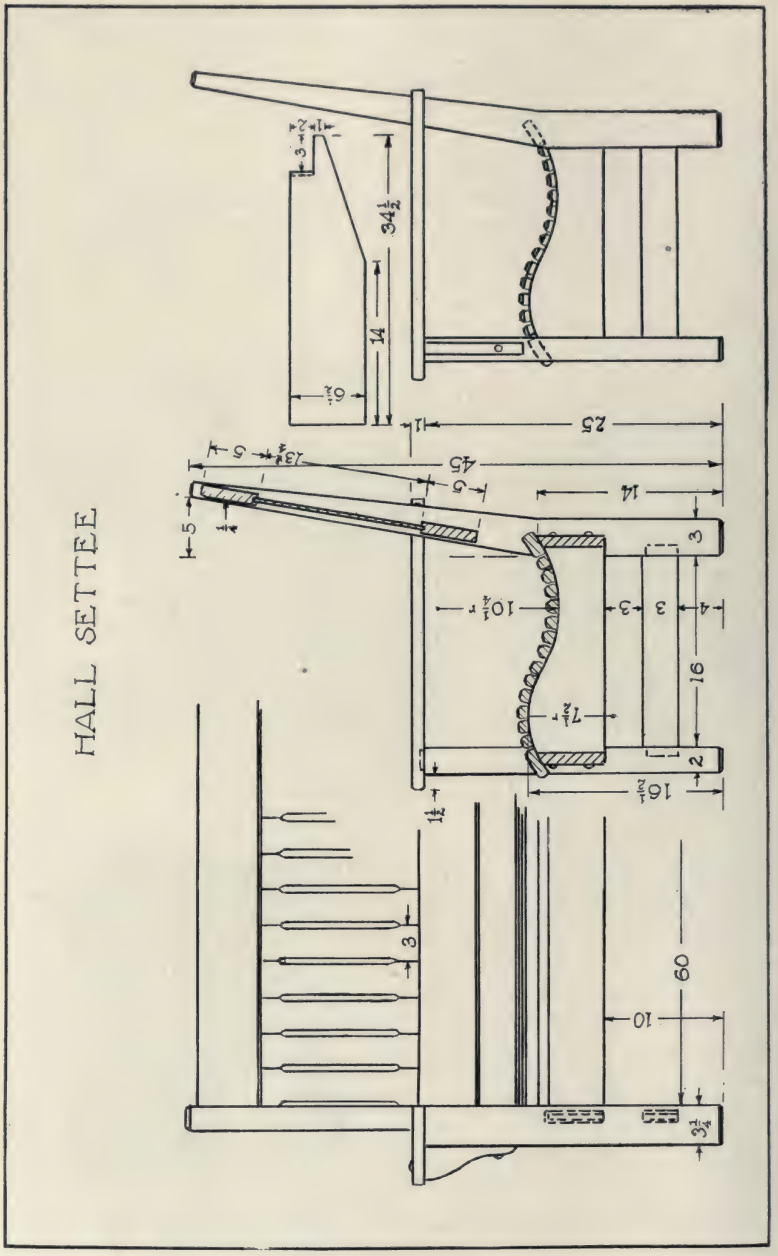
The time required to build the cabinet was seventy-five lesson periods of forty-five minutes each. The cost of the material was $8.50.



BRACKET.

The bracket shown in the accompanying photograph was designed as one of several to be used in decorating the main corridors of the school building. Plaster casts of such noted figures as Lincoln, Franklin, Bethoven, etc., were supported by them. This piece is of quartered oak and entirely hand wrought. It was sketched in full detail before being carved. The finish is of dark golden oak, rubbed to an egg shell gloss with wax and friction. The work required forty-three hours.



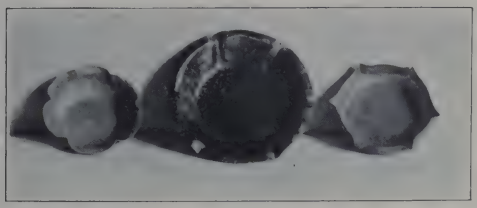

HALL SETTEE
34½
14
25
45
14
3
16
60
10
3

HALL SETTEE.

The hall settee shown herewith was designed for the larger corridors of the school building. The design is largely a class project. Comfort, too often forgotten, was one of the particular items at issue. The settee is comfortable.

The piece is built of straight grained white oak and given a mission oak finish. The seat slats are fastened into place with finishing nails, deep set, and the holes, instead of being puttied, are plugged by driving in round head copper rivets. The material in the settee cost $6. The copper plate in the center of the back proclaims the settee the property of the State Normal School and the product of the cabinet making class.





COPPER WORK.

The two smaller trays, showing execution of concave and convex fluting, are the work of Fred Landers, and show the extent to which fine texture and dextrous development, possible in small useful pieces, may be carried.

The larger tray is included to show how coarse texture may modify otherwise fairly good work and how important is this feature of texture.

DESK SET.

This desk set is composed of eight pieces and combinations, as follows: Desk pad, ink-well, pen tray, letter rack, blotter pad, paper knife, stamp box, book ends.

Open design is used throughout. Each piece, where it is liable to come in contact with polished furniture, is padded with green felt. The lid of the ink-well is hinged, the hinges being riveted in place. The spring brass bottom of the blotter pad is so arranged as to be easily taken out for the insertion of a new blotter as occasion demands. Design and construction are the work of John W. Park. The cost of the copper was $1.40, and the time required to build the project was fifty hours of forty-five minutes each.



ART METAL WORK.

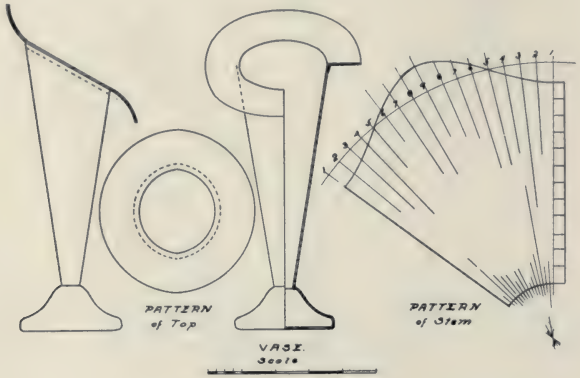
The articles shown on the following page are made of copper, silver and brass. One scarf pin is of silver, while the other is of copper, in the same design. The swastica and the Egyptian scarab fobs are of copper etched and raised. The O. N. S. fob is of silver. The plate has an etched border design, while the letters are sawed out and applied. This piece has been quite popular with the members of the class. A swivel may be used between the fob and the strap or between the strap and the watch. In this case a date mark, as "1916," may be applied to the back of the plate, as has been done in a few instances.





HARDWARE.

The hardware shown on the previous page was designed and made by the students and used to trim the pieces of furniture that they had made in the cabinet shop. The illustration shows cedar chest handles, drawer pulls and hinges.



VASE.

This piece, in copper, by Jas. M. Early, was built to show the development of the lap-seaming process. The design bears enlarging or reducing to suit the individual makers taste or as use may demand. The material cost 75 cents. The time required was nine hours.



REVIEWS

Agricultural Drafting. By Charles B. Howe. John Wiley & Sons, New York. 11x8¼ in. oblong; 63 pages; price $1.25, net.

This book is one of Wiley's Technical Series, edited by Professor J. M. Jameson. It has been written to assist agricultural students in securing a knowledge of the principles of mechanical drawing and their application to problems of farm life. It as an excellent textbook, and altho it is the first we have seen on this subject, it does not possess the weaknesses that often are found in a pioneer book. In technique, selection of subject-matter, methods of teaching implied or suggested it reaches a high standard.

The book begins with a section on drafting instruments, conventions used in drafting and examples of good forms of letters and figures. Then follows general instructions for arranging a drawing on a sheet and for "blocking out" a drawing. Projection, working drawings, conventional screw threads, typical machine parts, building construction, concrete work, and the making of farm maps follow. Especially valuable are the drawings and data with reference to concrete walls, steps, troughs, silos, cesspools and other applications of cement to farm use. Plumbing and sanitation is briefly treated.

A feature of the book is a series of loose-leaf problem and data sheets which are intended for use in connection with the book. These are published in separate form and constitute a course of forty problems which many a teacher will be glad to follow.

Industrial and Commercial Geography. By J. Russell Smith, professor of industry in the Wharton School of Finance and Commerce, University of Pennsylvania. Henry Holt and Company, New York. 5¾x8¾ in.; 194 pages.

If this excellent book is too comprehensive for a textbook for elementary industrial and junior high schools, it is certainly not so for a reference book for students and a guide for teachers. It aims "to interpret the earth in terms of its usefulness to humanity." It deals with human activities both industrial and commercial. In fact, the book consists of two parts, industrial geography and commercial geography. The chapter headings of the first part are the following:

Our changing environment; the place and nature of agriculture; the cereals; starch foods; the animal industry; the vegetable, fruit and wine industries; sugar, condiments and tobacco; fisheries; the fundamentals of manufacture; the forest industries and paper; fibers, textiles and clothing; leather and rubber; the machinery, ship-building and metal industries; chemicals, raw materials and manufacture; the mineral industries; the expansion of industry and resources.

These occupy about two-thirds of the volume. The book is enriched with 244 diagrams, maps, photograph and other illustrative matter. Especially valuable are the many statistical diagrams and maps showing the distribution of products by states and by nations.

Elementary Mechanical Drawing. By Charles W. Weick, assistant professor of drawing and design, Teachers College, New York City. McGraw-Hill Book Company, New York, 1915. 6x9 in.; 250 pages; price, $1.75 net.

This book is intended for use as an elementary textbook in technical, second-

ary, trade and vocational schools. It treats of the subjects usually taught in a beginning course in such schools—use of instruments, lettering, projections, geometric problems, etc.—in a very satisfactory way. To these are added a valuable chapter on mensuration and one on the reproduction of drawings, especially by the blueprint process. The main section of the book is entitled "mechanical drawing practice." This consists of 38 plates of problems with a page of notes and directions opposite each. These problems really comprise two parallel courses, one for students interested in woodworking and the other for those interested in metalworking. What immediately attracts attention in this section of the book is the fact that instead of following the present tendency of books on mechanical drawing to give problems unsolved, either by sketches or data or different views from the ones required, the author has given the solution of each problem accompanied by a "lay-out drawing" which suggests the correct method of procedure in working the problem. While some teachers will disapprove of the author's general practice of giving the solved problem for the pupil to copy, they will recognize the importance of placing emphasis on good draftsmanship and the best methods of procedure as emphasized in the lay-out drawings.

Architectural Drafting. By A. Benton Greenberg and Charles B. Howe. John Wiley & Sons. 11x8¼ in. oblong; 110 pages; price $1.50 net.

This book is one of the Wiley Technical Series for vocational and industrial schools, edited by Prof. J. M. Jameson of Girard College. Mr. Greenberg is a practicing architect who was formerly an inspector and draftsman in the Supervising Architect's Office, Washington, D. C., and in the building department, New York City. The book is not a series of plates to be copied, but it is a textbook setting forth the principles of the subject and the best practice. The text is illustrated with drawings representing types of construction and design. The book is essentially a treatise on practical building construction. Model drawing plates, as well as problem plates have been prepared by the authors to be used in connection with the book. These are sold in loose-leaf form. From these may be selected problems for a course of study to meet local needs.

The Future of Us Boys. "Edited in the words of grown-ups by a friend." Published by Babson's Statistical Organization, Boston, 1915. 5x7½ in.; 129 pages; price $1.00.

This book is an attempt to present vocational guidance from the boy standpoint. The author speaks as one of the boys, but uses the language of an educator who is acquainted with the recent efforts to make vocational guidance practical in Massachusetts. He speaks of "us boys," but with the knowledge and vocabulary of a mature man. This is rather disconcerting at times, if one has the habit of being conscious of the personality of an author as he reads. On the other hand the book presents many of the best arguments for vocational guidance and training in an off-hand sort of way that is likely to attract many readers who would not even attempt to read the average work on educational science. The book is printed in large antique type, with wide margins, on heavy paper, and is pleasingly bound. It is a unique book.

Pattern-Making. By Frederick W. Turner and Daniel G. Town; instructors in pattern-making, Mechanic Arts High School, Boston. John Wiley and Sons, New York, 1914. 5x7in.; 114 pages; price $1.00 net.

This book treats of tools, materials, lay-outs, templets, core prints, core-boxes, cores, skeleton patterns, sweeps, and several other subjects both elementary and somewhat advanced in the art of pattern-making. It gives some emphasis to the relationship that pattern-making bears to other machine trades. The book is well written and effectively illustrated with simple line drawings.

Preliminary Machine Drawing Course. By C. E. Handy. Longmans Green and Co., London. 8½x5¼ in. oblong. 40 pages of plates, 30 cents.

This book provides a graduated series of examples of machine parts for a beginner in machine drawing. The problems are given in perspectives which in many cases, present the object broken to show internal parts. Each drawing is dimensioned, altho it is intended to be used in connection with a model of the part represented. The book is intended for evening technical classes and students in junior technical schools. It is to be especially commended for its pedagogical method.

Furniture Designing and Draughting. By Alvan Cracker Nye, Instructor in Furniture Designing at Pratt Institute. Published by the William T. Comstock Company, New York. 7x10 in.; 126 pages; price, $2.00.

This is a revised edition of the book that was first published in 1900. It contains notes on the elementary forms of furniture, on methods of construction, and gives dimensions of common articles of furniture. A new section has been added to the book treating of the "Louis" furniture styles.

Art Course, Chicago Public Schools. Five drawing books—one for each of grades four, five, six, seven and eight—and a teachers manual. By Emma March and Lucy S. Silke. Published by Scott, Foresman & Co., Chicago.

This is not a series of drawing books, because no drawing is to be done in them. The outside appearance of each suggests a drawing book, but the inside consists entirely of illustrations with proper captions. Each book gives selected reference material in convenient form for the use of pupils. Its chief aim is to set a definite art standard for the grade in which it is used. The books contain reproductions of drawings to show technique, and of paintings, photographs and museum material which is to serve as subject-matter for study. The books contain some fine examples of lettering and many excellent plates of suggestions for design, some of which are in colors.

It is significant that in the public schools of the great city of Chicago, where many thousands of children have to be taught under one organization, that instead of establishing a mechanically organized course of problems to be worked out, the directors of art education, unwilling to submit to such a deadening method, even for their own convenience, have sought first to inspire and develop art feeling in each individual pupil and then to develop technique as far as may be practicable. They have set a goal for all pupils without prescribing that all shall take exactly the same steps toward reaching it. They have allowed for individual differences to a degree that is not common enough in the drawing work of public schools.

Practical English Punctuation. By M. Lyle Spencer, Professor of English, Lawrence College. Published by George Banta Publishing Co., Menasha, Wis., 1914. 4½x6¾ in.; 153 pages.

The purpose of this little volume is to be a guide to students and a reference book for writers. The governing idea in writing the book was practicalness.

Shop Problems. By R. J. Watson. Published by the Casino Technical Night School, East Pittsburgh, Pa. 5¼x7½ in.; 67 pages; price $1.00.

This is a collection of problems intended to supplement the standard textbooks in arithmetic. Most of the problems deal with materials that are common in the manufacturing industries. Many of the problems have been taken from actual business experiences. Sections of the book are devoted to the following subjects: the lever, machine shop, the lath, screw and thread cutting, universal milling machine, Ohm's law, expansion of metals due to increase in temperature, railway construction, belting, gearing, etc. The book is illustrated with several half-tones of machines with parts numbered and named.

Engineering Workshop Drawing. By Henry J. Spooner, of the Polytechnic School of Engineering, London, England. Longmans, Green & Co., New York. 9¼x6¾ in., oblong; 128 pages; price 50 cents net.

This book covers the first steps in engineering drawing. The text is comprehensive, but the technique of the drawings, from the American standpoint, is not all that could be desired.

RECEIVED*

Bulletins from the U. S. Bureau of Education, Washington, D. C., as follows:—

The Truant Problem and Parental School. By James S. Hiatt.

The Teaching of Community Civics. Prepared by a special committee of the commission on the reorganization of secondary education of the National Education Association.

History of Public School Education in Alabama. By Stephen B. Weeks.

Civic Education in Elementary Schools as Illustrated in Indianapolis. By Arthur W. Dunn.

Opportunities for Foreign Students at College and Universities in the United States. By Samuel Paul Capen.

The Rural School System of Minnesota. A study of school efficiency of H. W. Foght.

The Schoolhouse as a Polling Place. By E. J. Ward.

A Comparative Study of the Salaries of Teachers and School Officers. By a committee of the National Education Association.

Employment Certificate System: Connecticut. By Helen L. Sumner and Ethel E. Hanks. This is the first of a series of studies of the administration of child labor laws in various states. Issued by the Childrens' Bureau of the U. S. Department of Labor, Washington, D. C.

*Whatever is listed under this heading is usually for free distribution unless otherwise stated.

MANUAL TRAINING AND VOCATIONAL EDUCATION

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FOREWORD

FROM the viewpoint of the development of the movement for vocational education probably the most significant statements in this number are found in the article on "Trade Agreements" by *Miss Merle Higby* of the Minneapolis, Survey, in the brief editorial on the attitude of organized labor in New York City, and the joint action of the United Typothetae and the International Typographical Union as given on the first page in the department "Of Current Interest." At the present moment much thought is being focussed upon the needs of the industries and of industrial workers as determining factors in the decisions which must be made regarding the types of vocational schools to be established in the public school system, and regarding the conditions of admission to such schools.

On the school side of the vocational education problem, however, we should mention especially the article by *Charles L. Jacobs,* supervisor of manual arts and director of vocational guidance in the public schools of San Jose, California, the article by *R. W. Tarbell,* of Milwaukee, and the one by *Miss Ethel M. Johnson,* librarian of the Women's Educational and Industrial Union, Boston.

The article by *Frank A. Foster,* of the Engineering College Tangshan, North China, gives one instance of how the movement for industrial education is taking root in the Orient.

"Craftsmanship in Education," an address delivered before the Boston Manual Training Club by *James Frederick Hopkins,* director of art education for the State of Massachusetts, credits the manual training teachers with giving to education in general an important vitalizing spirit.

The series of problems in machine drawing by *J. Calvin Nicholson* becomes more interesting with each installment. The editor's article on "Easy Woodcarving" is intended to stimulate experimentation in this form of wood decoration.

A PURELY MATERIAL EXISTENCE, A WHOLLY MATERIAL CIVILIZATION, ARE JOYLESS, FOR IT IS ONLY THE THINGS OF BEAUTY THAT ARE JOYS FOREVER.

—Henry Cabot Lodge.

This Magazine is kept for sale at McClurg's in Chicago, and Brentano's in New York.

Entered at the Post Office at Peoria as Second-Class Mail Matter.

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Back on the Job With Carborundum Sharpening Stones

ONE of the first things to do when teacher and pupil start the September term is to put every edge tool in the school in working shape.

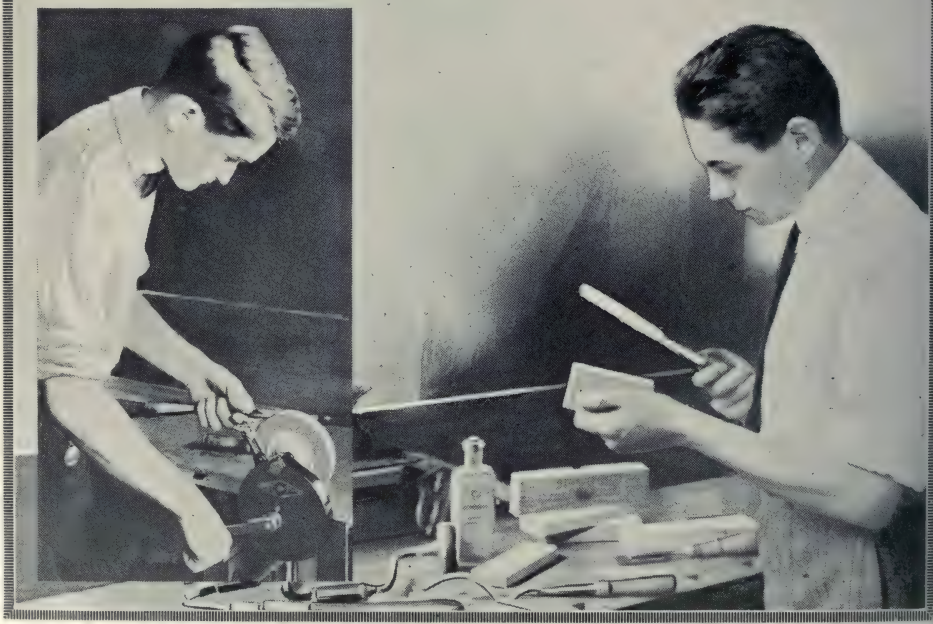
Carborundum Sharpening Stones and Grinders

Should be right handy for the job—keep in mind the special Carborundum Manual Training Stones—hard, sharp, fast-cutting stones made especially for manual training work.

And then for the tool and general grinding tasks, there are the Carborundum Niagara Grinders strong, durable, easy running—each equipped with a genuine Carborundum wheel.

¶ Have the pupils read of the making of the wonderful Carborundum crystals in the electric furnace? ¶ Let us send supply of instructive booklet "*The Romance of Carborundum.*"

The Carborundum Company, Niagara Falls, N.Y.



FIELD NOTES

IMPORTANT changes have just taken place in the personnel of the supervisory staff in Boston. John C. Brodhead, for several years assistant director of manual arts in the public schools, has been promoted to the position of associate director. Edward C. Emerson has been promoted to the position formerly occupied by Mr. Brodhead and will have immedate charge of the pre-vocational work for boys. George M. Morris, instructor in manual arts at the Dorchester high school, has been assigned to the department of manual arts as acting assistant director and will succeed Mr. Emerson in the supervision of elementary shopwork. Ludwig Frank has taken charge of the department of commercial art in the new high school of commerce which was opened in September. Chelsea L. Bailey, Francis O. Wood and J. Maynard Cheney have been elected to the corps of manual training teachers.

In addition to the above the following teachers have accepted pre-vocational positions: Orren Farr, woodworker, formerly of the Everett Evening Industrial School; M. Alonzo Eason, electrician, formerly of the Fitchburg High School Industrial Course; Geo. C. Rose, electrician, of Worcester; Bertrand L. Affleck, machinist, formerly of the Newton Vocational School; Norman P. Barker, painter, of Fall River; Arthur L. Primean, machinist, formerly of the Fitchburg High School Industrial Course; Wm. M. Rogers, electrician, of Boston; Myron W. Gray, woodworker, formerly of the Melrose Public Schools; John A. Fisher, machinist, formerly of the General Electric Company's apprentice school, West Lynn; Edwin G. Eklund, of Moorhead, Minn.; Leslie S. Burnell, printer, of Indianapolis, Ind.

Other changes to be noted are as follows: Miss Anna S. Streffert, manual training teacher has returned from her year's leave of absence spent in Norway; Miss Florence P. Donelson, of the Lyceum Pre-vocational Center, is taking her sabbatical year's leave of absence, visiting California and the West with Miss Grace E. Hayden, manual training teacher in the H. L. Pierce School, who is also taking a sabbatical year; Miss Donelson's place is being supplied by Edward Lahaise of the Sloyd Training School.

Boston now has twenty-one pre-vocational shops for boys, three of which were open for the first time in September. In Roxbury the Miles Standish building has shops for painting, electricity and machine tool practice. The remodeled Parkman building, South Boston, has shops for heavy cabinet work, machine shop practice and electricity. The William E. Cutter building, Charlestown, has shops for heavy cabinet work and electricity. In each case an adequate equipment of power machinery has been supplied.

Plans are being drawn for an addition to the Hyde Park High School to contain power woodworking and machine shops and a drawing room for the cooperative industrial course which has been successful under the charge of James C. Clarke, instructor. The Brighton, East Boston, West Roxbury and Dorchester high schools are organizing similar courses under the supervision of Mr. Brodhead.

In Portland, Oregon, a new trade school is soon to be made possible by the gift of $100,000 from S. Benson, a wealthy timber man of the Northwest. Mr. Benson takes a deep interest in the problems of employment, and his observations have made it clear that it is usually the untrained and unskilled who are looking for jobs. This suggested to him the value of an education that would prevent boys and girls from being forced into the hopeless army of the unemployed.

To this end, he has set aside $100,000 for a trade school on condition that the school district appropriate an equal amount. In addition to meeting this condition, the board of education has purchased ground covering six blocks at a cost of $160,000. The sums already provided will not fully meet the cost of the buildings and equipment, but other gifts are expected. The courses for the boys will cover carpentry, cabinet-making, foundry work, plumbing, and electrical construction and inspection; courses for the girls will include cooking, sewing, millinery, and other branches common to manual training schools. The new school will supplant two other schools now used for trade school purposes. Construction of the new building will begin in November.

(*Continued on p. VI.*)



Now for the Finish

A well-made model deserves the finest finish, and a beautiful finish will minimize the defects in a poorly constructed model.

Johnson's artistic wood finishes are especially adapted to manual training work and to those who build for pleasure, as they give good results in spite of inexperience.

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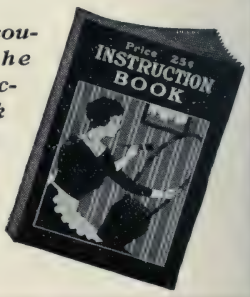
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FIELD NOTES—(*Continued from p. V.*)

At the last meeting of the National Association of Corporation Schools, James A. Roosevelt in presenting the report on allied institutions said,

"At the present time there is too great a tendency on the part of the educator and the business man to misunderstand each other's point of view. The educator is too apt to fell one of two things, either that a smattering of many subjects is real education, or that mental training, as arrived at by a study of unpractical subjects is essential. On the other hand, the business man tends to demand instruction along such practical lines, that the pupil does not secure a broad enough point of view to ever rise to the ranks of the executive.

"Both of the above points of view have their shortcomings, neither being wholly right or wholly wrong. Therefore, it should be the object of this association to reconcile these two points of view so that the greatest good can be attained.

"To secure the results we are after it is a question as to whether the work of bringing the educator and the business man closer together should be left only to local efforts in each community or whether it is possible for this association to take the various plans at present in force and try to draw up some comprehensive scheme applicable to all communities."

A study of the vocational opportunities and industrial education of girls in Philadelphia has been made by the Consumers' League and the Child Labor Association. The investigation was directed and the report written by Miss Cleo Murtland, assistant secretary of the National Society for the Promotion of Industrial Education. Among other things, the report points out that for the mentally normal girl between 14 and 16 years of age, there should be a vocational school which, at choice, may be entered instead of the high school. It also emphasizes the fact that the seasonal character of many industries demand vocational training in a variety of occupations; as a consequence the highly specialized worker must give place to the worker skilled in various occupations. This will prevent the deterioration that idleness brings thru a lowered standard of living caused by the lapse of income.

To the solution of the unemployment problem of women, a group of New York City women has been rendering a far-reaching service. Girls with technical skill have been given supplementary training along the line of their chosen occupations to render them more efficient; girls without special training, who have worked at a variety of "odd jobs" are given certain work tests to determine for what kind of work they are best fitted. To help girls who, because of unemployment, are in financial straits and thus unable to attend such classes, the committee is providing an emergency scholarship aid of sixty cents per day. Classes have been organized for the benefit of stenographers, bookkeepers and clerical workers, trade workers, and domestic servants.

The progress made by the American negro in the half century since his emancipation was shown in an exposition held in the Chicago Coliseum from August 22 to September 16. Special emphasis was given to the industrial development of the negro, and thru an appropriation of $1,000 from the Chicago schools, an interesting exhibit of manual training work is shown under the direction of George B. McClellan, assistant supervisor of manual training at the Wendell Phillips high school. The cost of the entire undertaking is estimated at nearly $100,000. The state of Illinois gave an initial contribution of $25,000, and a conditional sum of the same amount, depending on its duplication, dollar for dollar, from outside sources. Bishop Samuel Fallows of Chicago, is president of the Commission.

Dr. David B. Johnson, president of the Winthrop Normal and Industrial College, Rock Hill, S. C., is the recently-elected president of the National Education Association. Dr. Durand W. Springer, Ann Arbor, Michigan, will continue as secretary for another year. A movement has

(*Continued on p. VIII.*)

been inaugurated to broaden the scope of the N. E. A. William B. Owen, principal of the Chicago Normal School, is chairman of the committee appointed to make recommendations toward this end. In speaking of the work, Dr. Owen said that it should make local, division, state and national education associations form one great organized body of teachers, so that membership in local associations would carry membership in other associations, and also that plans should be worked out for making the N. E. A. a daily rather than an annual inspiration to its members.

When completed the $80,000 reinforced concrete manual training building which is now being erected in San Antonio, Texas, on the site of the high school, will be one of the most modern buildings of the kind in the South. It is to have two stories and a basement. In the basement there will be the molding and foundry room, a large forging shop, machine shop, pattern-making room, boiler room, janitor's room, boys' toilet room and space for the ventilating apparatus. On the first floor are to be located two large drafting rooms, a turning room, a joinery room, a finishing room, five large classrooms and an office. The greater part of the top floor is given over to the girls' domestic science work. In this department there will be two large cooking rooms, 30x32 feet, each one having a large pantry in connection; also there will be a millinery room, a fitting room, three sewing rooms, two classrooms, rest rooms, locker rooms, physics laboratory, chemistry laboratory and a room for the botany class.

Edward W. Boshart, formerly director of manual training at Mount Vernon, N. Y., has been elected principal of the new high school at Binghampton, N. Y. The new building has been constructed at cost of $725,000, and is said to be the best of its kind in the country. It is the only high school in Binghampton, and all the departments are under one faculty. The building facilities and equipment provide for courses in industrial arts, household art and commercial branches, in addition to the regular academic work. Superintendent D. J. Kelly has been untiring in his efforts to make possible the excellent building in which the schoolmen of that section are so much interested. Under these conditions Mr. Boshart hopes to carry out his plans for a school that will meet the needs of all the pupils in the community.

A four-year college course in domestic economy is being introduced this year in the College of St. Catherine, St. Paul, Minnesota. To enter this course a girl must have the same preparation which she would have for entering any standard literary or scientific college course. For graduating she must have credits equaling those earned in any other scientific course in a first class college. The action of the College of St. Catherine is in line with the progressive movement among the colleges that have caught the new vision.

J. A. Massel, special agent of the United State Department of Commerce, has just returned from an investigation of the machinery and machine tool trade in South America. While in Buenos Aires he was invited to inspect the National Industrial School where he found that nearly all of the school equipment was of German and English manufacture, most of it representing donations from German firms. This school, which is under the control of the Argentine government, sends out every year a highly trained class of men, who, when connected with private industrial plants, favor the makes of machines with which they are familiar. In his report to Secretary Redfield, Mr. Massel urged the importance of our manufacturers cultivating this trade by placing exhibits of their goods at the disposal of the school. Director Edwardo Latzina is very friendly to North America machinery products, and would welcome such exhibits.

During the coming year an attempt will be made by the Massachusetts State Board of Education to interest the cities and larger towns of the State in the establishment of continuation schools. To this end, Robert O. Small, Deputy

(*Continued on p. X.*)

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While at the Panama-Pacific Exposition don't fail to visit the Millers Falls Exhibit in Block 26, Avenue D, Manufacturers' Building.

Commissioner of Education, has prepared a lecture on the work and advantages of the continuation schools, illustrated by 104 views taken of the work of the Boston continuation schools the past year.

The first continuation schools in the State were those established last year in Boston. By an act of the Legislature, authority was granted permitting the establishment of such schools if the school authorities so desired. The act provided that experience with continuation schools should first be secured before making them compulsory. The past year's success in Boston warrants a state-wide campaign to further the extension of these schools.

At the annual town meeting, Clinton, Massachusetts, appropriated $500 to pay for the tuition of Clinton students, who will attend outside vocational and industrial schools this coming year. A month ago five students had already enrolled at the Worchester Trade School, at a total expense of $625 for tuition. This means that an additional appropriation will be necessary, unless the general expense fund is used. It is one interesting result of the new Massachusetts law. Under this law cities or towns which do not provide vocational courses for their students are required to pay the tuition of these students in the schools of other cities or towns which do provide the desired courses, if the board of education approves of the application.

Thru the Executive Committee of the National Institution for Moral Instruction, Washington, D. C., a prominent American business man has offered a prize of $5,000 for the best code of morals for use in character education in American homes and schools. The purpose of the "Morality Codes Competition" is to determine what moral ideas intelligent public opinion believes should be inculcated in the Nation's children and youth. Methods of moral education are not to enter into the discussion. Moral ideas, principles and ideals are the subjects to be covered. The contest is to be an inter-state contest, and it is especially desired that teachers contribute letters of advice stating what moral ideas they think should be emphasized in these codes. A circular of announcement will be sent to all who address an inquiry to the Institution.

The boys in the manual training department of the St. Paul public schools built and put up 2,200 bird houses this past spring. An exhibit of the bird houses was held in the Commerce building the first of April. Boys who wished to do so, put prices on their houses; they ranged from ten cents to fifty dollars. Only a few were left unsold, and these were purchased by the Ramsey County Men's Garden Club to place on public property. The money received from the sale of the bird houses went to the makers, and the expenses of the exhibition was paid by the sale of concrete bird baths and garden vases, which also were made by the boys in the manual training department.

During the past summer classes in vocational training for girls just out of the grammar school, have been carried on at the Elizabeth Peabody House, Boston, under the direction of the woman's department of the New England section of the National Civic Federation. The training consisted of household and laundry work, cleaning, cooking, sewing and mending, chamber work, the preparation and serving of meals, color and design, and business ethics. The committee reports that nearly every girl in the various classes is going back to school in September, some to the high school and others to trade schools, where they may be fitted for specific lines of work.

In Superior, Wisconsin, an all-day industrial school made up of the sixth, seventh and eighth grades of the Matt Carpenter school has been opened. By eliminating a number of studies carried in the regular schools, and by adding 45 minutes to the school day, it has been made possible to give the pupils two hours and 10 minutes of manual training each day. For the boys there will be work in carpentry, mechanical drawing, cement work, forge work and shoemaking. For the girls there will be instruction in cooking, sewing, millinery and elementary bookkeeping. Graduates will be eligible to enter the high schools the same as the graduates of other schools.

(*Continued on p. XII.*)



This bench is admirably fitted for sectional classes.

In Manual Training,

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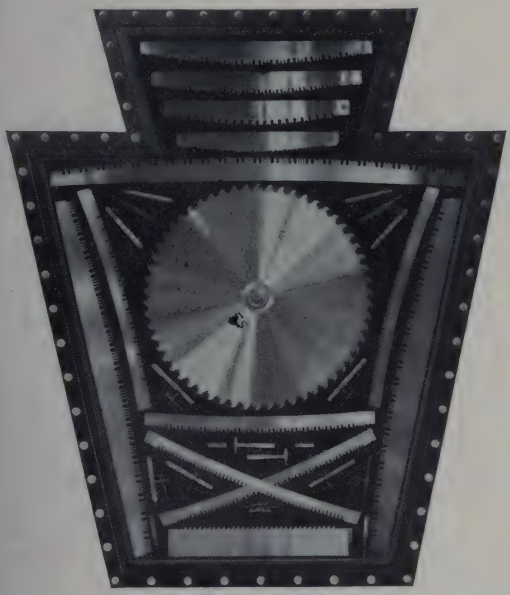
For many years, in all branches of science, Kewaunee Laboratory Furniture has been recognized as the American Standard. It has stood for Educational Ideals and Educational Efficiency.

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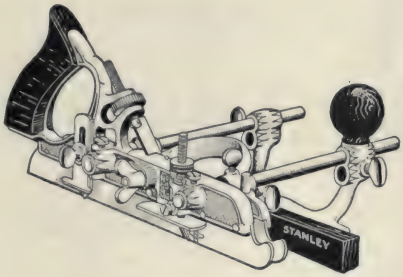
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Twenty-one cutters are furnished with each Plane, twenty-four additional cutters are regularly carried in stock.

An attractive twelve-page booklet printed in colors, explaining in detail the different uses to which **STANLEY "FORTY-FIVE"** may be put will be sent upon request.

STANLEY RULE & LEVEL CO.
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FIELD NOTES

(*Continued from p. XI.*)

The development of the junior high school idea is noteworthy. A new school of this type is just being completed in Rochester, N. Y. In discussing the purpose of the school, Superintendent Herbert S. Weet stated that it will aim to provide a more thoro grounding of the subjects already taught in the upper grammar grades rather than the introduction of a wider range of subjects.

J. G. Masters, recently elected principal of the Central high school, Omaha, Nebraska, has suggested a city survey to ascertain in what way the high school may best serve the people. Mr. Masters appreciates the fact that the schools should meet the special needs of the community, and that those needs are not identical in scarcely any two places.

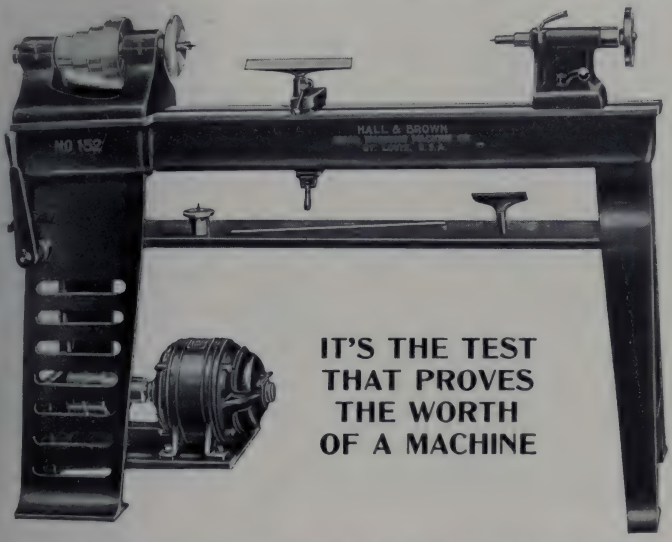
During the past year emphasis has been given to prevocational work in the schools of Houston, Texas. The pupils in one school spent half time in academic work and half time in shop work, the latter consisting of cabinet making, cement construction, sheet-metal work and electricity. One of the gratifying results of this work has been the fact that the boys in these classes have remained in school longer than otherwise would have been the case. Half of them had already left school but came back to get this special training.

In order to secure the best possible results in planning a central trades school in New Orleans, Dr. David S. Hill has spent two years making a searching study of the industrial vocational needs of New Orleans and the surrounding region. In formulating definite suggestions for the erection of the school, Dr. Hill has recommended that the following men pass judgment on his plans: P. P. Claxton, chief of the United States Bureau of Education; William T. Bawden, specialist in industrial education for the United States Bureau of Education; Charles A. Prosser, director of the Dunwoody Institute of Minneapolis, formerly secretary of the Society for the Promotion of Industrial Education; Arthur Williston, principal of the Wentworth In-

(*Continued on p. XIV.*)

OUR NEW MODEL No. 152 12-inch SPEED LATHE

MOTOR DRIVEN FOR ALTERNATING CURRENT



IT'S THE TEST THAT PROVES THE WORTH OF A MACHINE

is the most modern of Speed Lathes. Leads all others because of its splendid qualities as a lathe for woodworking purposes. A self contained machine driven from below.

The headstock is broad of base, so as to allow the belts to pass. Motor is carried on a heavy bracket at bottom of leg stands, giving the longest possible belt centers, thus assuring smoothest and most efficient transmission of power.

Eccentric lift provided by lever shown at front raises the motor bracket for belt adjustment and lowers it for tension.

We specialize in high-grade equipment. It will pay you to get acquainted with our line. Complete description and prices upon request.

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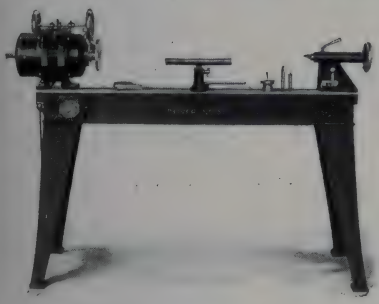
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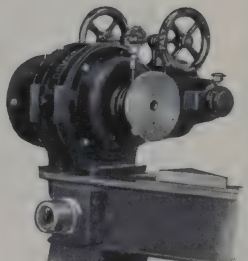
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Starrett Tools are Standard Tools. That means there is no slightest variation from the standard measures.

One ten-thousandth of an inch measured by a Starrett instrument is exactly one ten-thousandth of an inch the world over.

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on account of their accuracy proclaim the good workman. Modern methods of manufacture and inspection require the utmost accuracy and workmen are obliged to have the instruments for such work and skill in their use.

Starrett Tools are recognized by every superintendent in the land as tools of standard accuracy.

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New York London Chicago

The L. S. Starrett Company
BY INVITATION MEMBER OF

FIELD NOTES

(*Continued from p. XII.*)

stitute of Boston; Lewis Gustafson, superintendent of the David Ranken, Jr., School of Mechanical Trades of St. Louis.

One of the most unique schools in the world is the trade school for cripples operated under the name of the "Hospital of Hope" by Dr. Charles H. Jaeger, professor of orthopedics at Columbia University. It is designed to teach any cripple a trade which will make him capable of self-support. Any boy or man under 35 years of age may be received into this school and taught a trade free of charge. The school is financed by a wealthy man who desires to remain unknown.

Few cities are so generous in their support of technical education as are those of New Jersey. Newark appropriates $20,000 per annum and the State $10,000 for the support of the Newark Technical School. This institution has no endowment. It was organized in 1885, in accordance with the industrial education law of March 24, 1881, and is operated under this law and the supplements enacted at subsequent sessions of the Legislature.

According to plans made at a recent meeting of the board of education, Saratoga Springs, N. Y., a vocational school will soon be established, in which shopwork for the boys and domestic science for the girls will be pursued. Half of the school time will be spent in vocational work, and the other half will be devoted to the regular school subjects. Pupils of the seventh and eighth grades and the high school will be eligible to enter the vocational school.

The vocational night school in Altoona, Pa., is distinctive for its large attendance and the wide range of ages of the students. Last year's enrollment was 2030, and the pupils ranged from 14 to 65 years. There were 34 instructors and 65 classes, covering instruction in mechanic arts, household arts, commercial branches, foreign languages and elementary school subjects. The mechanic arts classes have the use

(*Continued on p. XVIII.*)



Illustration of our New No. 25A Outfit

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MANUAL TRAINING

For years we have studied the requirements of schools and the experience gained proves that the *best* Tools and Benches are the cheapest in the long run. They are more uniform in quality, last longer, give better results and in every way are preferable. Our hobby *since 1848* has been QUALITY and we aim to carry *only the best.*

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Anthony's Elements of Mechanical Drawing
Gives a thorough drill in geometric construction and the theory of projection as applied in a wide range of practical drawing. **$1.50.**

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A handbook and text, valuable as a brief course, covering the essentials of the subject. **$1.50.**

Daniels's Freehand Lettering
A practical manual, including plates of alphabets. **$1.00.**

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Valuable for its accurate data regarding textile fabrics, their manufacture and use. **$1.25.**

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For beginners and for shop-workers. No other book includes so many industries in so teachable a form. **$1.00.**

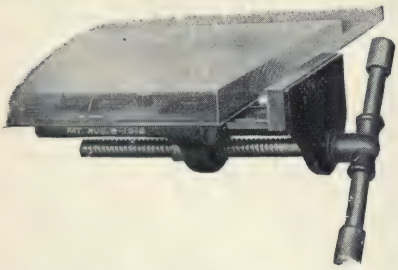
Halstead's Working Drawings for Cabinet-Making Models
A collection of working drawings of furniture for high school classes. **$2.00.**

Halstead's Manual Training in the Grades
A collection of working drawings of models for the 5th, 6th, 7th and 8th grades. **$2.00.**

Reilly's Rational Athletics for Boys
Commended by the leaders in physical education. **90 cents.**

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THE BEMIS STANDARD VISE



Strong—Positive—Durable and Cheap.
They don't break, slip or let go.
It has the advantages of the continuous screw vice and is as rapid as the so-called quick acting vice.
It is not an experiment but has been thoroly tried out and perfected.
Made with or without dog for holding work on top of bench.
The very thing to replace your worn out wooden vises at small expense.
Send for circular.

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FIELD NOTES

(*Continued from p. XIV.*)

of the entire high school equipment costing $40,000. This was the gift of the Pennsylvania Railroad Company.

The New Jersey State Federation of Labor, which has just concluded its sessions in Jersey City, passed a resolution providing for a special committee of three to consult with the State Federation of District Boards of Education on vocational and industrial education in the public schools, and to make suggestions as to the content of such courses. The Federation also went on record in favor of having all machinery used in such school in charge of experienced workmen.

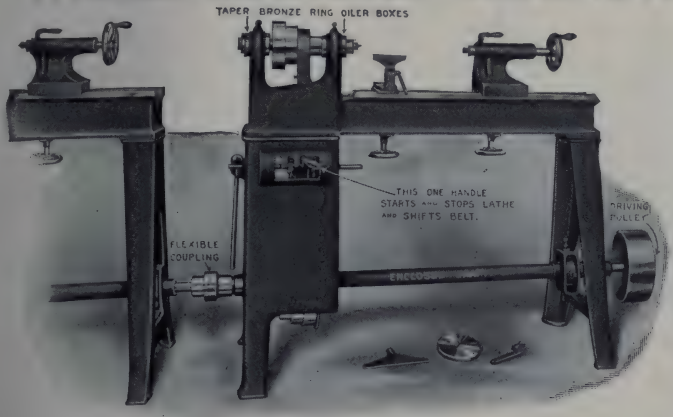
For the coming year the night school courses in the Technical High School, Oakland, California, will embrace a larger variety of studies than usually obtains in such schools. There will be six commercial courses covering stenography, typewriting, bookkeeping, commercial law, commercial spelling, and salesmanship. For those who desire to take up other vocational work there will be courses in cabinet work, blacksmithing, iron molding, carpentry, electrical engineering and automobile construction and driving.

An interesting development in the educational field is the announcement by Tuck School of Finance and Business Administration at Dartmouth that it will open this fall a course in employment as one of the phases of business management; that is, it will conduct a course to train men in the knowledge and art of employing other men for corporation service. The questions coming before a properly trained employment executive are innumerable, and his services in perfecting an organization are of vital importance.

One of the sessions at the second national conference on "Universities and Public Service," held in Boston last August, was devoted to a discussion of "The Part-time Principle in Education, Combined with the Principle of Learning by Doing." Those who took a leading part

(*Continued on p. XX.*)

WELLS MANUAL TRAINING LATHES



WELLS Shaft Underdrive Lathe with Single Handle Control

SAFETY AND SIMPLICITY—

That is what all supervisors and instructors want and must have in a Manual Training Lathe.

THE NEW "WELLS" LATHE with the SINGLE HANDLE CONTROL

has no equal in those and other essential features. We welcome investigation and comparison.

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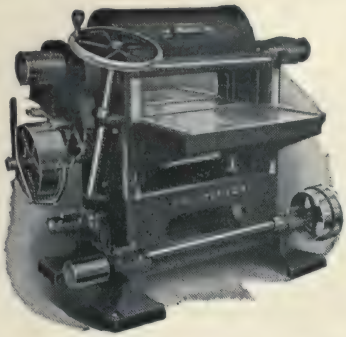
is so very satisfactory in those Schools that have adopted it as standard equipment, that you should carefully investigate the line before you select on the wood working machinery for your School. Ask for catalog giving complete description, and telling about our line of band saws, saw tables, jointers, borers, planers, planers and matchers, disk-grinders, hollow chisel mortisers, and Universal wood workers.





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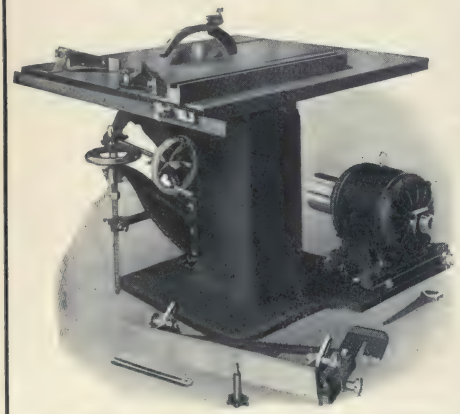
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FIELD NOTES

(*Continued from p. XVIII.*)

in the discussion were Edwin G. Cooley, of the Chicago Association of Commerce; H. E. Miles, president of the Wisconsin State Board of Industrial Education; and Burt Williams, former president of the Wisconsin League of Municipalities. It is interesting to note that all of these speakers were from the middle west.

Increased facilities for vocational training will mark the opening of the Vocational School for Boys in New York City this fall. The new courses will include electric sign flash lighting and operating, sign painting, commercial photography, and show card writing. There will also be an extension of the work in automobile repairing, and an entirely new layout of the printing department.

The Boston Mechanic Arts High School has been reorganized on an industrial instead of a manual training basis, and its aim now is to fit students for the executive rather than for the strictly operative side of industry. At Hyde Park, cooperation has been effected between students and the factories; the students work half a day in shops and factories for wages, and devote the other half day to their studies.

With the idea of further developing the work of their own schools, the members of the board of education, Virginia, Minnesota, have just completed a tour of inspection of the trade schools located in Chicago, Milwaukee and Gary, Indiana. With such first-hand knowledge of what these trade schools are doing, the board can better determine what they should undertake to do along these lines.

In Des Moines, Iowa, the domestic science and domestic art work are to be centralized in the North high school. A four year course is to be given which will be equal to that in special training schools. A certificate of attainment in these subjects will entitle holders to a certificate to teach them in the public schools of the State.

During the last session of the Wisconsin legislature the old law covering aid for industrial

(*Continued on p. XXII.*)

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CUTTERS—Our extensive line of Paper Cutters and Shears serve every requirement for cutting. Styles in hand lever, hand wheel, power and automatic clamping. Prices $4 to $750.

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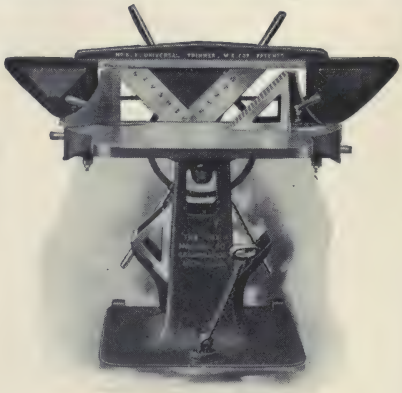
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Instructor of Printing,
Lakeside Press School of Printing,
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A Textbook of Printing For Students' Use

This book presents a series of exercises explaining and illustrating the most approved methods used in correct composition. It contains practical examples of correct composition, and meets the conditions found in the printing shop. Each example covers a distinct phase of typography, while it gives the student actual practice and also presents a clear explanation of the theory underlying the work in which he is engaged. This system of instruction has been thoroly tested and proved satisfactory. The suggestions offered for teachers are based upon actual experience of instructors both in factories and public schools.

It includes information regarding the following: Proof readers' marks and their use, Lay of the type case, Correct spacing, Proper justification, Points on good typography, Distribution and care of type, Proper use of quotation marks, Initial letters, Proper margins, Sizes of paper, cards, and envelopes.

PRICE, POSTPAID, $1.50
DISCOUNT IN QUANTITIES

THE MANUAL ARTS PRESS
PEORIA, ILLINOIS

FIELD NOTES

(*Continued from p. XX.*)

education was amended, so that a city of the first class may now receive $20,000 per year as state aid for industrial education, while any other city, village or town may receive $10,000 per year. Formerly, the limit was $10,000 for all.

A vocational guidance office accessible to women students thruout the year, will be maintained at the University of Wisconsin. It will be the purpose of this office to aid women in determining their vocations, and in shaping their courses to afford the best preparation for the vocations chosen.

Out of the 80 girls who completed the six weeks' summer course at the Worcester Trade School for Girls, all but one desire to be admitted to the regular day classes when the school opens in September. One group established a record for the school by completing the six weeks' required work in three weeks.

For the model house that is to be opened in connection with the vocational school in Amsterdam, New York, the boys have done all the carpentry work in the remodelling of the building, and will construct all the furniture for it. The girls will make the bed and table linen and design and make the floor coverings and hangings.

In Manchester, New Hampshire, a Catholic vocational school for girls will be opened this fall. It will offer courses in all the subjects common to a good business college, in addition to sewing, dressmaking, millinery, and household economics.

A three months' practical course in home nursing and emergencies will be given this year at Northrop Collegiate School for girls, Minneapolis, Minnesota. Miss Louise M. Powell, superintendent of the School of Nurses at the University of Minnesota will have charge of the work.

The notes that have been in use in the shop of the State Trade School, Bridgeport, Connecti-

(*Continued on p. XXIV.*)

Memphis Vocational Grammar and High School



Springfield, Illinois; Santa Fe, New Mexico; Petoskey, Michigan and many other high schools selected our candidates for their manual training vacancies. Be sure to write immediately if you are available. Or, enroll early for positions opening with the second semester. **Get our Superior Service.**

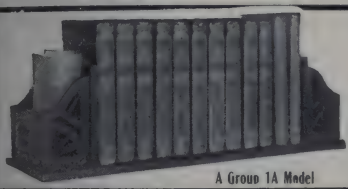
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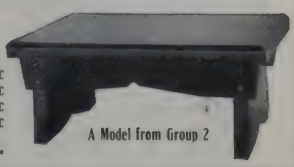


A Group 1A Model

Illustrated Working Drawings of Type Models in Wood Working

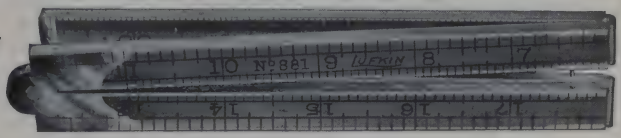
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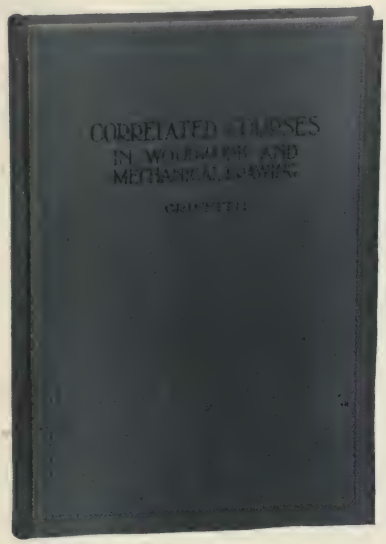
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FIELD NOTES

(*Continued from p. XXII.*)

cut, have been compiled by Superintendent James F. Johnson and published in book form under the title "Practical Shop Mechanics and Mathematics." It has been adopted as a text by the apprentice schools of several western railroads.

A new domestic science building at Stout Institute, Menomonie, Wisconsin, is being constructed at a cost of $200,000. It occupies one-half of a city block, and when completed will be a valuable addition to the educational facilities of the Institute.

Eleven graduates of the Lane Technical High School, Chicago, have accepted positions as instructors in manual training in the high and continuation schools of Porto Rico. This makes a total of 38 Lane graduates who have gone to Porto Rico as teachers of manual training in the last two years.

A bill has been recently introduced in the Alabama legislature authorizing the establishment of a vocational department in the elementary and high schools of the state. Provision is made for the teaching of practical agriculture, mechanical trades, and all other industrial arts and sciences.

Thru school improvement associations there is a wide movement in Alabama which has been active in introducing industrial training into the rural schools. Each county association works along lines indicated by a survey of local conditions.

According to statistics, children leaving the Boston grammar schools to go to work changed their places of employment an average of three or four times a year, but since the continuation schools opened, barely 15 per cent of the 2,300 children in attendance have changed places within the year.

A course in homemaking covering four years will be added this fall to the curriculum of the Worcester Girls' Trade School.

(*Continued on p. XXV.*)

FIELD NOTES

(*Continued from p. XXIV.*)

Joseph Vincent Baron has been appointed supervisor of drawing and manual training in the public schools of Gardner, Maine.

The Board of Education, Waterville, Maine, has voted to purchase the necessary equipment for manual training work.

Recent school legislation in Minneasota provides that schools may receive special aid from the state to cover the cost of courses in home economics, manual training and commercial courses, regardless of whether they offer agricultural instruction, as was required by the previous law.

In less than five years after its opening, Wentworth Institute, Boston, has found it necessary to add another five-story educational unit to its present buildings. According to the plans it will be completed by September, 1916. The Institute will then be able to take care of about 2,400 boys. The past year it has had an enrollment of 1,300 pupils.

Bookbinding is to be introduced in the sixth grade at Waltham, Massachusetts, the coming year. The work will be in charge of Lawrence J. Loring, the instructor in manual training.

Milton Clauser has been elected supervisor of manual training in the public schools of Salt Lake City. For twelve years Mr. Clauser had been supervisor of manual training in Denver.

The school committees of Dover and Foxcroft, Maine, have elected Clifford L. Brownell, of Martville, New York, instructor in manual training for the coming year.

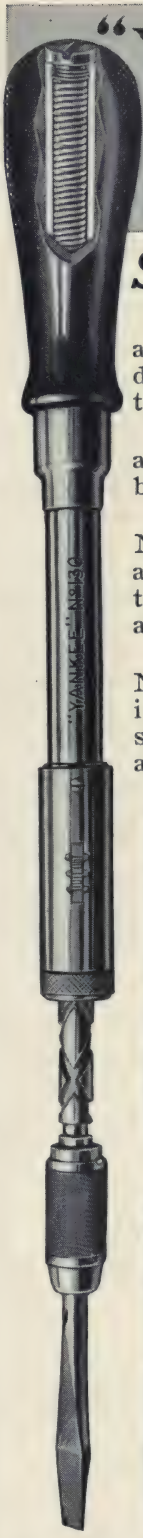
Lloyd Awalt has been appointed to teach manual training in the high schools of Laurel and Hyattsville, Maryland.

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229 pages, 5x7, illustrated. Cloth, $1.25 net.

PRACTICAL SHOP MECHANICS AND MATHEMATICS *By James F. Johnson*
A clear and concise treatise on elementary mechanics and mathematics as applied to actual shop conditions.
130 pages, 5x7, illustrated. Cloth, $1.00 net.

ARITHMETIC FOR CARPENTERS AND BUILDERS *By R. Burdette Dale*
A practical book for the trade and for use in all vocational and manual training schools.
228 pages, 5x7, illustrated. Cloth, $1.25 net.

CONTINUOUS AND ALTERNATING CURRENT MACHINERY PROBLEMS *By Wm. T. Ryan*
These problems were prepared to be used in conjunction with Morecroft's elementary text-book on "Continuous and Alternating Current Machinery."
36 pages, 5¼x7¾, illustrated. Cloth, 50 cents net.

THE ESSENTIALS OF DESCRIPTIVE GEOMETRY *By F. G. Higbee*
Includes those portions of the subject which poss ss industrial utility, and which develope the qualities of mind so essential in a draftsman.
204 pages, 6x9, illustrated. Cloth, $1.80 net.

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BOOK NOTES

Readings in Vocational Guidance is the title of a new book by Meyer Bloomfield, director of the Boston Vocation Bureau. In it are collected together the most important addresses, reports, etc., on the subject. It is, however, more than a mere compilation, because it is a carefully organized presentation of vocational guidance for the use of the student of education. The price is $2.25. It is published by Ginn & Company.

Scott, Foresman & Co., of Chicago, have just announced a new book on mechanical drawing by Professor James D. Phillips and Herbert D. Orth of the University of Wisconsin. This is the second of the series of books being issued by this company under the editorial management of Professor Fred D. Crawshaw. The book is entitled *Mechanical Drawing for Colleges and Universities.* The outline of this book indicates that much attention has been given to methods of presenting the subject so as to secure substantial results in the limited time devoted to drawing in a college course.

During the past few months there have been inquiries for a good book on period furniture. We have examined several books but none of them seem as satisfactory from the teacher's standpoint as the recent book entitled *The Practical Book of Period Furniture,* by Harold Donaldson Eberlein and Abbot McClure. The book contains 371 pages, including 250 illustrations—photographs and line drawings. It is published by J. B. Lippincott Company, Philadelphia. The price of the book is $5.00 net.

During the past few months several new magazines have come to our desk. One of these is *The American School,* edited by Carrol G. Pearse, William B. Owen, and James W. Searson—all men of high standing and rich school experience. It has an important message and bids fair to deliver it in a forceful way. It is published by The American School Publishing Co. of Milwaukee. *Ungraded* is another new journal. It is edited by Elsie A. Seyforth and Emmy R. Turner, and published by The Ungraded Press, New York City. It is to deal especially with the problems of the backward child. A third new publication is *The Immigrants In America Review,* edited by Frances A. Kellar and published quarterly by The Committee of Immigrants in America, 95 Madison Ave., New York City. It is devoted to the maintenance of the American standard of living, education and progress among immigrants.

A NEW BOOK ON ELECTRICAL CONSTRUCTION.

The development of vocational schools and prevocational courses in elementary schools, as well as the enrichment of high school courses thru the introduction of more work in manual arts seems to be creating a demand for a new type of technical book. This book is not a theoretical treatise, neither is it a correspondence course text. It occupies a middle ground between them, it is elementary, but it presupposes an efficient teacher. It emphasizes the best practice and technique; it adds principles, theory, data, when these can illuminate practice. It is neither a textbook in the fullest measure, nor is it merely a laboratory note-book; it is between the two. It gives practical problems to be solved, points out the important principles involved in their solution, tells what material must be used, asks questions concerning each problem, and provides space for answers and notes.

Such a book is *Problems in Electrical Construction,* soon to be ssued by the Manual Arts Press. This has been prepared by Walter B. Weber, whose article in the September number of this magazine has called forth many requests for detailed information. Mr. Weber is the instructor in charge of the electrical construction work at the Seneca Vocational School, Buffalo, N. Y. He has had ten years of practical experience as a journeyman in electrical construction work, two years of which time he was foreman in a telephone manufacturing concern. He is a member of the International Brotherhood of Electrical Workers. After most of his practical experience he graduated from the vocational course at the State Normal School in Buffalo, N. Y., and has had three years of successful experience in teaching day and evening school classes in Buffalo.

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ESSENTIALS of WOODWORKING

The remarkable sale of this well-known textbook has necessitated larger editions. Larger editions reduce cost and this saving is now passed on to the student. For this edition, the type was recomposed and the printing done from new plates throughout.

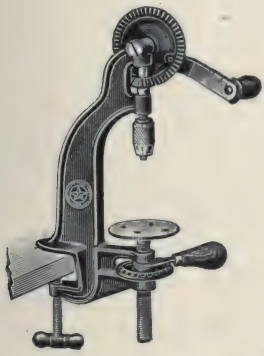
Students are greatly benefited and busy teachers relieved of needless work wherever a satisfactory text is used. "Essentials of Woodworking" meets every requirement. It is used by high school and grammar school students in all parts of the United States. It has made definite instruction in woodworking possible, raised the standard of scholarship, enriched courses of study and saved time for both students and teachers. Adopt "Essentials of Woodworking" and let *your* students benefit.

THE MANUAL ARTS PRESS
PEORIA, ILLINOIS

TRADE NOTES

During the past year we have received many inquiries concerning places where lumber for manual training work can be purchased. Teachers, especially in the smaller towns remote from lumber centers, want to buy a few pieces of mahogany or walnut or oak or any one or more of the choicer varieties of wood for furniture or small projects. We have also received several letters from lumber dealers complaining that so much time was required in getting out these orders, no two of which were any where near alike, that they could not afford to sell the lumber in that way without charging what seemed to be too high a price.

The above facts have been stated in the hope that some of our readers will suggest to us a minimum number of sizes, lengths and thicknesses, which might be carried in stock to meet real needs. If any reader is interested in this matter and has any suggestions to offer, we hope he will send them without delay to The Manual Arts Press.



BENCH DRILL PRESS NO. 208.

An attractive bench drill press of very moderate cost, known as No. 208, has just been put on the market by the Millers Falls Company. The above illustration shows its general lines and character. The chuck has a capacity of 0 to ¼ inch for round shank drills, and is of the popular Star pattern with three jaws operated by springs that are protected from injury and guaranteed not to get out of order. The small

(*Continued on p. XXX.*)

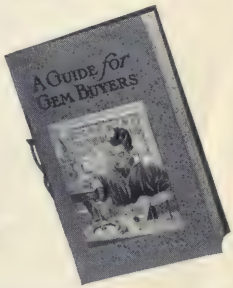
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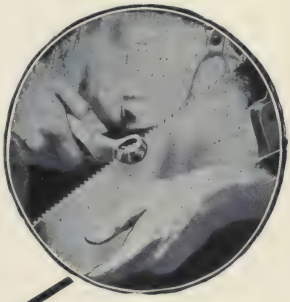
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TRADE NOTES

(*Continued from p. XXIX.*)

gear is of steel and the tool is equipped with ball bearings. The chuck is held rigidly close to the main frame, and feed is obtained by raising the table with a ratchet lever. The table is provided with holes for the insertion of pins or screws to act as stops or rests for the work. The height over all is 18 inches; maximum distance from chuck to table, 4½ inches; speed of gears, 3½ to 1; weight, 7½ lbs. Each bench drill is packed in separate wooden box.

Manual training teachers no longer confine their designs in furniture to mission lines, but they are giving considerable attention to period furniture. This permits of more decoration and calls for a stain in keeping, for we cannot wait for Time to bring out the beauty of the wood. In order to meet the demands for a suitable stain, The Marietta Paint & Color Co. have just brought out their Jacobean stain. This is made in several shades, ranging from the light nut brown to the darkest brown, with a black undertone. The stains are made with pigment colors, ground very fine, and are tempered to dry in ten to twelve hours, so they can be shellaced without softening. When properly applied they produce the effect of an acid stain, in that the flakes are stained a deep rich brown, giving the effect of a glaze, without being muddy. The manufacturers will be glad to furnish detailed information to those interested.

"The Professor and the Saw" is the title of a little booklet which The Simonds Mfg. Co. are distributing. The experience of a college professor who turned to carpentry as a means of regaining his health is based upon fact, and is interesting. Following the story are complete directions for building a canoe, a flat-bottom row boat, a curio cabinet, a desk, book shelves, a serving table and an ice box. Each working drawing is accompanied by a pen drawing and the bill of material. The last pages of the book show some of the Simonds saws which are suitable for home and school shops. The book is beautifully printed and invites reading from beginning to end.

(*Continued on p. XXXII.*)

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GEORGE G. GREENE

Instructor in Lane Technical High School, Chicago, Ill.

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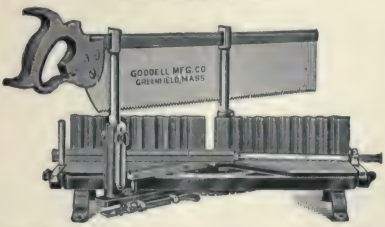
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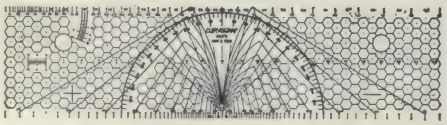


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TRADE NOTES

(*Continued from p. XXX.*)

A very thoro treatment of wood finishing is the booklet, "The Proper Treatment for Floors, Woodwork and Furniture," issued by S. C. Johnson & Son. It is printed in nine colors and describes fully their complete line of finishing materials for both old and new wood, also for the various wall coverings and pressed board materials. It is an interesting fact that when the order for this booklet was placed it was the largest contract for fine color printing that had ever been placed in the state of Wisconsin. A copy of this booklet will be sent to manual training teachers upon request.

Among the saw and saw tool manufacturers represented at the Panama Exposition, the exhibit of Henry Disston & Sons is unique. A set of balanced scales on a keystone, signifying justice, is the trade mark of this firm, and the keystone is made the motif of the exhibit schemes. Four large keystones, 12 ft. 6 in. high by 10 ft. 6 in. wide at the broadest part, and 2 ft. thick, are mounted on a revolving turret 20 ft. in diameter. The turret and four keystones on which the saws and saw tools are mounted constitute the exhibit proper.

The Dewey Blueprint Co., Manitowoc, Wisconsin, have recently completed a list of the various towns in which their books or blueprints have been sold. The list includes towns in every State of this country, every province of Canada, the Hawaiian Islands, Porto Rico, India and Australia. This enterprising firm is rendering a needed service to manual training teachers in furnishing them blueprints covering every branch of the manual arts.

E. B. Frain, 723 S. Fifth Avenue, Chicago, announces illustrated standardized lists of manual training and cooking equipments showing everything required, with number of each, for classes of various sizes. He is also specializing in all kinds and sizes of lumber.

Our readers will be interested in John Wiley & Sons' announcement in this issue of new books published during the past summer. The titles cover various subjects, including studies of soils

(*Continued on p. XXXIII.*)

TRADE NOTES

(*Continued from p. XXXII.*)

and crops, market gardening, decorative design, shop mathematics, electrical machinery problems, and arithmetic for carpenters and builders.

SOMETHING NEW!



"OLIVER" NO. 51 MOTOR HEAD SPEED LATHE.

It is now possible to buy a lathe which will run at any speed from 800 to 3,500 R. P. M. Heretofore variations in the speed of lathes have depended upon cone pulleys with three or four steps which gave a corresponding number of speeds. Now all this limitation by cone pulleys and belts is done away with in the new "Oliver" motor headstock speed lathe. This is made possible thru the invention of a new type of alternating current motor which is being build exclusively for the Oliver Machinery Co., Grand Rapids, Michigan. This motor will operate on any single or polyphase circuit of proper voltage, and also operate satisfactorily on any frequency from 25 to 60 cycles. The wiring from the main line to the motor comprises two wires only, making its connections the simplest possible.

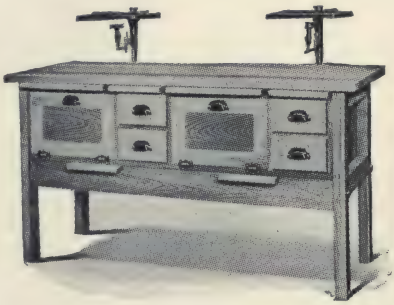
The current is controlled by the snap switch on the front of the bed and below the headstock, as in the above cut. Changes in speed are produced simply by turning one or the other of the handwheels just back of and a little above the headstock.

The reputation of the Oliver Comany for high grade machinery ought to be sufficient guarantee of the quality of this unique lathe, which seems to mark a new era in motor head tools.

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AFTER HOURS

COLOR MUSIC INSTRUMENT.

THE other day I was reading the "Life and Works of Thomas Cole," who was famous about seventy-five years ago for his landscape paintings, especially of the Catskill Mountain country where he lived. The book gives selections from his diary in which the following was recorded on November 8, 1834:

"I made a small circular diagram of colours today. It reminded me of an experiment I have long wished to try, and have thought a good deal about. The idea was suggested by something I read, when a boy, I do not know where. It is what may be called the music of colours. I believe that colours are capable of affecting the mind, by combination, degree, and arrangment, like sound. * * * It is evident that there is an analogy between colour and sound; and with study and experiment it might be traced through all its ramifications. I am not aiming to prove the analogy, but to show that there is plausibility in the theory that an instrument might be constructed by which colour could be played, and which would give to those who had cultivated their taste in the art, a pleasure like that given by music.

If I attempted to make an instrument, I should try the experiment with six colours and their semitints. * * * The instrument might be played by means of keys, like those of a piano, except, that instead of their moving hammers to strike strings, they might lift, when struck, dark or black screens from before colored compartments. Transparent compartments, with either sunlight or artificial light behind, would perhaps produce the most brilliant effect."

This may serve as a suggestion to some young inventor.



SAFETY FIRST!

Drawing made by Mr. Brigham of the Trenton School of Industrial Arts.

DOLLAR-GODDED UTILITARIANS.

THOMAS COLE was extremely sensitive to the beauties of mountain and forest. He loved the trees and it hurt him deeply to have the trees cut down. Here is what he wrote to a friend in 1836:

"They are cutting down all the trees in the beautiful valley on which I have looked so often with a loving eye. This throws quite a gloom over my spring anticipations. Tell this to Durand—not that I wish to give him pain, but that I want him to join with me in maledictions on all dollar-godded utilitarians. * * * If I live to be old enough, I may sit down under some bush, the last left in the utilitarian world, and feel thankful that intellect in its march has spared one vestige of the ancient forest for me to die by."

DR. JOHNSON'S DEFINITION OF GENIUS.

ONE hundred and fifty years or more ago Dr. Samuel Johnson gave a definition of genius which may be interesting in these days of vocational guidance. In his *Life of Cowley* he writes as follows:

"In the windows of his mother's apartment lay Spencer's *Faerie Queen,* in which he very early took delight to read, till, by feeling the charms of verse, he became, as he relates, irrecoverably a Poet. Such are the accidents which, sometimes remembered, and perhaps sometimes forgotten, produce that peculiar designation of mind, and propensity for some certain science or employment, which is commonly called Genius. The true genius is a man of large general powers accidentally determined to some particular direction. Sir Joshua Reynolds, the great painter of the present age, had the first fondness for his art excited by the perusal of Richardson's Treatise."

Is Dr. Johnson responsible for our present system of education? Ever since his time we seem to have been trying to produce men "of large general powers" and then expect them to be "accidentally determined to some particular direction."

In Manual Training Work

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have reached a standard of excellence, through practical working properties and results that others aim at and fail.

These properties are difficult to describe satisfactorily, but are quickly made evident on an actual test of the goods themselves.

Read what Mr. C. Edward Newell, Drawing Director, says:

"Permit me to thank you for the great courtesy in recently furnishing samples for our high schools. You are most certainly artists in wood finishing. The No. 1407 Old English Acid Stain gives a beautiful effect on cherry. This finish is being used on the furniture that our high school boys are making to send to the Panama-Pacific International Exposition, where we are furnishing an individual model room, one of the eight rooms to be assigned space in the Palace of Education."

Here is a typical example of how our products qualify. If you are still experimenting or looking for the higher ideals in wood finishing, ask us to send you a copy of our big portfolio "Modern Wood Finishing"—the standard textbook on wood finishing. We are always glad to furnish testing samples and finished panels gratis.

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MANUAL TRAINING
AND
VOCATIONAL EDUCATION

NOVEMBER, 1915.

THE ORIGIN AND GROWTH OF THE MOVEMENT TO TRAIN TEACHERS OF SALESMANSHIP.

CASSIE L. PAINE.

OWING to the transition, during the last forty years, from the small general store of our towns and cities to the large department store, there has necessarily occurred a marked change in the store personnel. The proprietor, who had formerly bought his merchandise, arranged it in his store, personally met and waited upon his customers, and kept the record of his transactions in his own way, was gradually deprived of all of these duties and placed in an office which was usually somewhat remote from the scenes of great activity in the store. In this quiet spot he was obliged to devote his time to studying the ever-increasing problems of this new form of business, to instituting and directing the lines of its growth, and to selecting the people to whom he could delegate the multitude of new duties suddenly presented. As a result, it often became necessary to fill the many newly-created positions in the store with persons who had had no former experience in the work and no real aptitude nor inclination for that particular kind of service.

The place in the store organization where this condition was found most frequently was among those who did the selling. Passing goods over the counter to the customer who asked for them, and taking her money in return for the merchandise, does not at first glance appear to be a very skilled or laborious task. And that was the way this particular part of the store work was looked upon by the managers in those first days when the department store was rapidly coming into being thruout the mercantile world. The divisions of the business that had to do with the handling of money in large amounts, as in the buying departments,

or with the compilation of the financial records of the store, as in the auditing departments, or with the placing of the opportunities offered by the store before the minds of the public, as in the advertising department, were early considered important factors in the success of the store, and a great deal of care was given to the selection of executives to fill these positions. But it seems to have been the general feeling that, once the customer was inside the store, *anybody* could pass her the goods and take her money in exchange. As a consequence, few qualifications were demanded of a salesperson, small wages were paid for the service, and very inefficient work was accepted. The natural result of such a situation can quickly be seen. The lack of dignity attached to the work tended to prevent an intelligent and ambitious young woman from entering the field of selling in a department store if she could find any other kind of work in which her ability could be used to advantage. The small wages tended to keep the standard of living low, and put temptations in the paths of the salespeople. And the occupation itself was looked upon as stultifying and, to a certain extent, hazardous for young women. Twenty years ago a woman of culture and ability did not care to advertise the fact that she was a salesperson in a department store.

But as the department stores became more firmly established and the details of their organizations were more carefully worked out, it was possible to analyze critically the different factors influencing the success of the business. As a result of this study, some of the more intelligent merchants began to realize that the *manner* in which customers were met and treated while in a store influenced considerably the amount of merchandise they bought at that place. The time was passing when all of the attention could be given to the merchandise end of the business. Several department stores were to be found in the same town or city and all were likely to carry about the same varieties of goods. Competition was beginning to be keen in the mercantile world, so there was little difference in the prices of merchandise among the stores. It was evident, therefore, that some other factor than kind or price of merchandise must be emphasized to cause the customer to choose to make her purchases in one store instead of another. This other factor was recognized by some of these more farseeing men as *service*. Other things being equal, the customer was likely to buy the articles required by herself and her family at the store in which she was made most comfortable and was given most real assistance in her selections.

DISCOVERY OF PRINCIPLES IN SALESMANSHIP.

There were from the first, certain salespeople in nearly every store whose success in selling far exceeded that of their associates in the same work. The high records of these individuals had generally been accounted for, as was the success of certain teachers in the early days before the value of training in teaching had become generally understood, by the phrase, "Salespeople are born and not made." But there were now to be found a few business men who were beginning to analyze out of the transactions of these successful salespeople certain principles which could be employed to advantage by any one engaged in selling who could be led to understand and apply them. The successful salesperson had simply discovered these principles for herself and used them because she had more insight than her companions.

It became clear, therefore, to these thinking men that if the "service end" of the department store business was to be improved, that result could be brought about only thru the increased intelligence of the selling force. In the light of this new discovery, certain progressive business men in the country began to try to devise ways and means of increasing the efficiency of their salespeople thru some form of teaching. Up to this time the degree of intelligence had not been looked upon as affecting materially the economic value of a salesperson, but now different schemes for using education for this new purpose were put into operation. One plan was to have the younger employes continue their regular school studies after beginning work in the store. Consequently they were taught for a length of time each day by a regular school teacher. In most cases, however, the teacher had had no training in business and could not adapt the general school subjects to the particular needs of the store job.

Another way of solving the problem was by having instruction given by one of the successful salespeople. But this person had usually had no training in teaching. She had been successful in dealing with customers and in handling the system of the store, but she knew nothing of the laws of psychology nor of the principles of teaching, and had no intelligent idea of the efficient way to awaken the intellects of her pupils. She could tell them how *she* had handled different situations, and could require her pupils to memorize certain rules or regulations that had to do with store business; but she could give them no intelligent analysis of the reasons why certain methods of procedure in business were the ones most likely to be successful, nor any breadth of vision to meet entirely new situations.

A third way of educating salespeople was to have instruction given in the form of lectures by psychologists or theorists. These lectures were usually inspiring and frequently dealt in a general way with many of the store problems. But as the point of view of the lecturer generally dominated the situation, there was little in this kind of teaching to stimulate independent thinking on the part of the salesperson. The value of this form of education usually depended more upon the force and personality of the lecturer than upon any help he gave in solving specific problems. As can be seen, the instruction given to salespeople in those early days was lacking in one or the other of these two fundamental principles of efficient teaching,—the increase of intelligence thru self-activity, and the directed application of this intelligence towards the pupils' particular lines of work.

There was another group of people, however, besides those connected with the management of department stores who were becoming interested in salespeople. This group was made up of the men and women who were studying the social problems of our country. Organized investigation of the conditions among workers of all classes was leading to a more intelligent inquiry into rates of wages and reasons for such rates. Upon investigation it was found that working people receiving low wages were paid in many cases all they earned. That was generally true of salesgirls. As a class, they were not interested in the success of the business, and they saw no way of hastening their advancement in the store. They went thru each day's routine of duties with little pleasure in the work and accepted the wages the firm allowed them. At that time the principal reason for an increase of wages was the length of service in the store. These girls did not realize that more efficient work could *compel* better wages, nor that intelligent interest in selling would add happiness to their daily lives. It became evident, therefore, to those thinking people who were trying to improve social conditions that increased intelligence of the salesgirls was the only solution of their problem, and increased intelligence could be brought about only by some means of additional education. Consequently, the services of education in equipping a salesgirl for her job were beginning to be desired by the two classes of people most interested in her,—the employer, who wished to improve his business, and those members of society who wished to promote the general welfare of its individuals.

BEGINNING OF ORGANIZED STUDY OF PROBLEM.

It is difficult to trace any new movement from its initial conception, but the very first institution in the world to undertake to increase the

efficiency of women in the business of selling by a method never before tried out in this particular field of work, was the Women's Educational and Industrial Union of Boston. This institution was founded in 1880 by a body of far-seeing Boston women "for the purpose of increasing fellowship among women, in order to promote the best practical methods for securing their educational, industrial, and social advancement." The purpose of the organization is explained in the above words, taken from its charter, and its activities from the first have been directed primarily towards the discovery of new opportunities for women. To accomplish this object there are always upon the board of managers and staff of directors of the Union, women of large vision and infinite resource who can investigate the possibilities of different lines of women's work, and determine the essential qualifications of the workers. In 1905, one of these women, Mrs. Lucinda Wyman Prince, became particularly interested in the condition of the salesgirl, and the next year decided to devote her energies to the study of this problem.

Mrs. Prince was eminently fitted for this work. She was a trained teacher, and through her own interest in education and that of her husband, Dr. John T. Prince, for many years connected with the Massachusetts State Board of Education, she had developed an unswerving faith in the power of education to improve social conditions. She had a firm conviction that education was the only weapon with which to attack the problem of the salesgirl. Mrs. Prince had for several years done social work among the young girls who worked in department stores and had become familiar with the difficulties and temptations of their work. She had been a resident in the first college settlement house in Boston where, thru organizing and leading clubs and other activities among these girls, she had studied their problems outside of the store. She felt that the right start of the business life of these young girls was fundamental to their permanent happiness in life and to their value to society.

Feeling sure, therefore, that the salesgirl's condition in life was directly dependent upon her efficiency, and that her efficiency could be increased only by a period of training having for its purpose a mental awakening which would result in a more intelligent interpretation of her work, Mrs. Prince set about to interest the employers and the salespeople in her theory. This was an entirely new form of approach to the problem. Up to this time all the instruction salespeople had ever received had been given by a school teacher who knew little or nothing

about business, or by an efficient worker in the store who knew little or nothing about education, or by a theorist who knew little or nothing about the peculiar problems of the individuals. To have the problem of an increase in the efficiency of salesgirls undertaken by one who knew both them and their work, who believed that an awakened intellect was at the basis of efficiency, and who attempted to bring about this condition by the use of the fundamental laws of psychology and the application of the principles of teaching, was an unheard-of thing.

Mrs. Prince began her experiment by interviewing the store superintendents in Boston. Everywhere she was met by the same questions, "What proof can you give us that your scheme will work? What do you know about selling in a department store?" She therefore decided to put herself to the test for the benefit of the cause. She had never worked in a store, but she had a trained mind, an interest in people, and a knowledge of many of the salesgirls' problems. She asked for the privilege of matching the worth of these assets against the one of long experience in selling. As a result, Mrs. Prince entered a certain Boston store one morning and took her place before a table of merchandise as any other new salesgirl would have done. Around her were saleswomen who had sold in the store for years, who were familiar with the merchandise, the salesbook, and the crowds frequenting the department store. At the end of the day, Mrs. Prince had beaten every one of her associate saleswomen, having sold three and four times the amounts of some of them. The employer became interested, the nearby employes became interested, and Mrs. Prince knew then that she had struck the right method to convince people of the soundness of her theory. More days of selling were spent by her in that store and in other stores, and in every case the results were the same,—namely, the monetary proof that a high degree of intelligence could be made as useful in selling goods in a department store as in any other occupation.

MAKING THE NEW IDEA CONCRETE.

But the idea of a *school* for salesgirls was not easy to carry out even after the people most interested had become convinced that education was of practical use. The employers saw no time when their salespeople could be spared to be educated, and the salesgirls themselves rebelled at the idea of "going to school" again. Many of them had gone to work in the store to escape going to school. The early struggles, therefore, of making the new idea concrete are an interesting chapter in the history

of this movement. At first a few ambitious girls were persuaded to go to the classroom at the Union for instruction by Mrs. Prince after their day's work in the store was done. The reason for the failure of this method is obvious. After a long day behind the counter, the average individual is in no condition to engage in active mental work. In a short time this scheme was abandoned. The next plan was to teach girls who had never sold but who wished to become salespeople with the promise that they would be employed as specials at $1 per day whenever certain stores in Boston needed extra help. This arrangement was also discouraging. In the first place, these people had no apperceptive basis for the instruction and with so little opportunity for the practical work, it was almost impossible to make the lessons vital. Then there could be no assurance to these girls of permanent employment at the end of the course. This plan lived only a short time.

But even under all these discouraging conditions, the value of an increased intelligence on the part of the salespeople was beginning to be felt by some of the Boston merchants, and in 1907 a few of the most progressive managers offered to employ the girls who were taking the training course for one half their time at a wage of $3 per week. This was indeed a long stride in the right direction. Now the teaching could be made coincident with the store practice, the concrete material for the instruction being the exact situations which the girls met in their business experience. The analyses of these experiences were of vital interest to the members of the class, and the deduction of the business principles involved could be made by the girls themselves. These women also were receiving a regular definite wage during their period of training and were practically assured of permanent positions at the end of the time. The distribution of the time for the school work, however, was awkward during this arrangement. The girls went to school for a two-hour period both at the beginning and ending of the store day. As the Union at which the school was held is about a ten minutes' walk from the stores, there was considerable loss of time in getting to and from the school. The teacher's time was also badly broken up, so that there was a great waste of her services. An improvement upon this arrangement was necessary.

Results of the training could now be distinctly seen. Frequently the amount of sales by these half-time people exceeded those of their associates who spent all their time in the store. As these facts became evident, it was gradually borne in upon the minds of the employers that there was no loss involved while these people were taking the training and in many

cases a real gain was realized. Therefore, in 1908, a new plan was put into operation which has continued, with modifications, up to the present time. This plan was to send regular employes of the store to the Union School of Salesmanship for five forenoons a week for a certain period of time, having them sell in the stores for the remainder of the day and making *no reduction* in their wages during the time of training. The value of this plan can be seen at once. Theory and practice could be strictly coincident, and there was no waste of time on the part of either pupils or teacher thru poor distribution of work.

(*To be Continued.*)

"WE MAINTAIN THAT, IN THE PRESENT STATE OF CHAOS AND DIFFICULTY, THE VOCATIONAL SCHOOL WILL BE A GREAT HELP AND A POWERFUL DETERRENT FOR THE GIRL WHOM UNGUIDED CIRCUMSTANCE NOW THROWS INTO THE UNDERTOW OF CIVILIZATION, SINCE IT WILL GIVE EVERY GIRL AN HONORABLE PRIDE IN INDEPENDENCE AND THE ABILITY TO KEEP HERSELF INDEPENDENT."—R. M. Weeks.

PLACEMENT WORK FOR WOMEN AND GIRLS IN NEW YORK CITY

REPORT OF THE COMMITTEE ON PLACEMENT OF GIRLS OF THE VOCATIONAL GUIDANCE ASSOCIATION OF NEW YORK.

LOUISE C. ODENCRANTZ.

THE problem of placing workers in suitable employment is one that confronts not only those interested in employment agencies and their development, but also those who are trying to solve the present much-mooted questions of vocational guidance. Placement work consists not only in finding a particular job for an applicant for work along certain lines, but quite as frequently it becomes the function of the placement agent to choose for him the line of work or trade as well. Indeed, the act of placing a boy or girl in that job which will be best suited to his or her abilities, future welfare, health, and happiness, might almost be offered as a definition of vocational guidance.

The Vocational Guidance Association of New York showed its appreciation of the close relation between placement work and vocational guidance when it appointed two committees to keep in touch with and learn something of the methods and extent of placement work carried on for girls and boys by various organizations in this city.

In the spring of 1913, the Committee on the Placement of Girls planned a survey of the extent and methods of such work among girls in New York City. A simple questionnaire was sent to every organization which might be engaged in helping women and girls to find positions. The mailing list included such varied organizations as day nurseries, orphan asylums, missions, working girls' boarding houses, churches, settlements, and employment bureaus. The list was limited to social agencies and did not include commercial agencies, private business schools, or typewriter agencies, which place considerable numbers of their graduates and operators along commercial lines. While the problems that such schools raise in their placing of girls and women in positions which they have not investigated are serious, it was not expedient or practicable to include them in this brief study.

The list of questions aimed to get information along two lines: first, as to the number of organizations which are called upon to solve the problem of "vocational guidance" in helping individual girls into jobs and occupations; and second, the extent to which they are called

upon to offer some solution thru practical application to the big problem of finding work for the unemployed. While the first named object was of primary importance in the minds of the committee when the inquiry was first planned, the results brought out more significant material in connection with the second.

Returns were received from 88 organizations, of which 62 were found to be doing some sort of placement work for women and girls. Societies with such promising titles as "Ladies Employment Societies," usually connected with churches, proved upon inquiry merely to furnish work to poor women connected with the mission or church; while such an unlikely source as a Spanish Settlement House revealed extensive efforts along these lines. Among these 62 organizations, 46 found positions for workers merely in an incidental way, and only 16 organizations carried on the placement work either as a primary object, or in a more or less systematic way.

VARIETY OF AGENCIES INCIDENTALLY INTERESTED IN PLACEMENT

Settlements and clubs led numerically among the 46 organizations which found positions for women and girls only incidentally to their regular work. The various kinds of organizations ranked as follows:

Settlements and clubs	20
Churches and missions	11
Sisterhoods and deaconesses' homes	4
Homes for working girls, etc.	4
Relief societies	3
Day nursery	1
Orphan asylum	1
Public high school	1
Other organizations	1
Total	46

From a statistical point of view, the results of the inquiry as to methods and numbers placed by these orgainzations which did placement work only incidentally were entirely unsatisfactory. This fact in itself, however, is significant. It shows better than anything else could the very haphazard way in which the work is being done. The replies indicate in most cases how indefinite their methods were. "If a request comes from a well-known firm and if I happen to know a girl who needs the work, I turn over the request to her," was one report. In

another case, "If any of our members out of work come to us, one of the workers goes with them or assists in some way in securing a position." One settlement "sometimes has calls for workers and tries to fill them from among the members of the house."

As to the numbers placed in a year, even those in charge of the organizations often could give no more definite answer than "a very few," "a great many," "girls placed all the time," or "a few children." Seven pleaded guilty to having placed "only a few," while four could say they had placed "a great many." Fourteen others stated approximately the number they believed had been placed during the year 1912. The numbers reported as placed in a year ranged as follows: 1, 10, 10, 10, "over 10," 12, 19, 20, 20, 20, 25, 28, 50, and 148.[1] The other 32 organizations could not even make a guess. As records were rarely kept, the figures represent for the most part merely guesses; yet they indicate the extent to which organizations with widely different functions from that of placement work, and equipped entirely for other lines of work, have felt themselves called upon to give of their limited time and effort to this sort of work.

That settlements, missions, and other such philanthropic organizations are called upon to find positions for 20, 50, and even 148 girls or women, without any equipment or trained workers for carrying on the work raises the question of how they are able to do it. In five cases the placement was made by volunteer workers in the organization, who in their clubs or relief work found places for girls and women wanting jobs. In other cases helping a girl to find work was but one of the innumerable and diverse tasks that fall to the lot of the regular workers in such organizations—the teacher or settlement worker, the church worker or deaconess, the missionary or matron of a working girls' home. Of course no fees were charged either to applicants or employers, and for the most part no record of any kind was kept of placements. In a few cases the records kept of those in touch with the organization served a small purpose in this field as well. Some kept such records in books,

[1]Since this inquiry, the report of the International Institute for Young Women of the Y. W. C. A. for 1913 stated, "We have no employment bureau but we placed 200 girls at employment last year and are placing more this year. We have set this standard for ourselves—We never place a girl at employment where we know the sanitary and moral conditions are not good, and where we know that she will not be justly treated. On the other hand, we never send a girl to a place without telling just what we know about her, and we do not take the part of a girl who has not been fair and honorable with her employer."

while others were more up-to-date with card catalog systems. But usually not even the entry of "simply name and address," was made, which described the system in one place.

The two following replies summarize the general method by which placements are made. "It sometimes has calls for workers and tries to fill them from among the members of the house," and "When application is made for a position, we seek a place for the applicant." In the first case there will be a wild scurry for some one to fill the job, and in the second, the person interested in the applicant may make a personal application or call up by telephone some employer whom she knows personally or who is interested in the work of the organization, and ask whether room can not be made for the applicant in his store, office, or factory; or the agent of the organization may visit stores or factories in the immediate neighborhood to find a position for the applicant. In one case, a settlement worker has been able to find places for seven girls in a near-by brush factory. In another, applicants, both boys and girls, are sent to a large department store where a friend of the organization can secure openings. A club worker reported that "for two of our older girls we have secured work in the dressmaking establishment patronized by one of the ladies interested in the club. Now and then letters of reference have been furnished to department stores vouching for the honesty and respectability of the applicant."

Because the calls and positions found are for the most part secured thru friends or members of the organizations, the assumption is made that everything,—sanitary conditions, industrial and moral conditions,—is all right and investigation is seldom made either of the work to be done or work-room conditions. Only ten stated that they investigated conditions while three others did "sometimes." Among those which did not investigate, was one which had placed as many as 50 girls, another 20 and another 19 in the course of a year. Of course the nature of the work at which some of these applicants are placed does not always require that the workplaces be investigated. In some instances, the applicants were older women asking for day's work or office cleaning, and these were placed in families known to the organization. The numbers of organizations which had placed women and girls in the different kinds of work are given in the following list. Many did not specify the kinds of work at which they had placed the girls. While this list gives no indication of the extent of the placement work of these 46 organizations yet it suggests the relative importance of the various lines.

Office work	9
Work in stores	9
Housework	9
Factory work	7
Dressmaking	4
Day's work	4
Office cleaning	2
Institutional work	2
Nursemaids	1
Caretakers	1
Millinery	1
Telephoning	1
Needlecraft school	1
"Trades for the skilled"	1

AGENCIES SPECIALLY ACTIVE IN PLACEMENT WORK

Even in the case of the 16 organizations which concerned themselves directly with placement work, this often formed only a small part of the duties of the organizations. Their efforts in this field were generally restricted to the particular group of women and girls with whom the organization was in touch in its primary function. The list included the following:

Free Employment Agency for the Handicapped of the Jewish Community (placing men chiefly.)
Committee of the National League on Urban Condition among Negroes.
Casa Maria—Catholic Spanish Settlement house for working girls.
Manhattan Trade School (for students from the school only).
Washington Irving High School (for students only).
Employment Directory of the Fellowship House of The Hebrew Sheltering Guardian (for after care of orphans).
Salvation Army Labor Bureau (for men chiefly).
Young Women's Hebrew Association Bureau.
Young Women's Christian Association Bureau and West Side Branch.
Emanuel Sisterhood of Personal Service.
Church Mission of Help (dealing chiefly with delinquents).
Labor Bureau for Unemployed of Faith Mission of Collegiate Dutch Reformed Church.
Hudson Guild Employment Bureau.
Welcome House (Hebrew).
Alliance Employment Bureau.
Girls' Protective League.

The nature of the organization indicates largely the types of workers they reach and the lines along which they are placed. For instance,

the organization dealing with negroes finds work for its applicants chiefly in domestic work. Again, the trade and high schools find work for the students who have been taught in the schools. In two cases the placing is entirely at day's work and office cleaning, and in another, in domestic and institutional work. One places only the handicapped—at light outdoor work. Another, a settlement for Spanish working girls, places many girls in domestic work, and others in offices and at similar work, the girls applying in connection with commercial classes maintained in the settlement.

Those who recorded the number of placements of women during the year 1912 reported as follows:

Alliance Employment Bureau, factory and clerical work	855
Y. W. H. A. Bureau, office, clerical workers, learners in factories	333
Y. W. C. A. Bureau, office, clerical workers, girls at sewing, governesses, children's nurses, etc.	1,975
Y. W. C. A.—West Side Branch, girls for stores, factories and housework, children's nurses, etc.	68
Emanuel Sisterhood of Personal Service, mercantile and factory work	513
Welcome House, factory and housework	75
Labor Bureau for the Unemployed of the Faith Mission of Collegiate Dutch Reformed Church, day's work	260
Manhattan Trade School, factory work	335

Some of the other organizations also reported numbers placed, but the figures obviously included both men and women.

While the numbers placed or reached by such organizations in their placement work are insignificant when compared with the 400,000 or more women at work in New York City, the numbers, nevertheless, are large enough to render their methods worthy of comment. In one instance, the work was done by a volunteer. In the other cases, there was either a paid manager or superintendent whose entire time and labor were given to placement work; or at least there was some one for whom this formed the principal work. In only four cases however was a fee charged of workers, and in three cases of employers as well. Fifteen kept a card catalog of their applicants, and one kept a record in book form.

INADEQUATE INVESTIGATION OF PLACES OF EMPLOYMENT

Perhaps the most serious question is the investigation of places to which workers are sent. The lines along which the organizations were likely to make placements seemed to determine whether or not places of employment were investigated. Eight of these 16 organizations reported that they investigated the places of employemnt. Four which found

positions for women and girls in offices, in factories and stores, and with private families, reported that investigations were made only in some cases, while three stated definitely that they did not investigate. In two of these three cases, the applicants were older women who were placed in day's work and office cleaning, and investigation was thought unnecessary; while in the third case, an organization placing large numbers of women in offices, and with private families as governesses, nurses, etc., did not investigate on the ground that "we do no industrial placing."

That even these organizations which are carrying on such work more or less definitely, do not perform one of the fundamental duties and responsibilities of the non-commercial placement agency, is important. An investigation means not only an examination of the workplace itself with respect to physical and moral conditions, but a consideration of such other factors as hours and opportunities for advancement, which closely affect the welfare of each worker.

In regard to the placing and guidance of girls under 16 years of age, 24 of the 62 organizations doing some kind of placement work found positions for girls of this age, while 17 reported that they never found positions for children under 16. The remaining organizations did not report on this point. One organization that placed girls under 16 was in an Italian neighborhood, and its placement problem seemed entirely to be one of finding work for young Italian girls of 14 years. Some had been placed in dressmaking; but the complaint was noted that it was hard to find openings for them. In the case of the orphan asylum, all the children were placed at 14 years of age. While they were given some preliminary training in the asylum, it was hard to find openings for them in office or factory work, or in the various sewing trades. Another organization dealing with widowed mothers also felt itself called upon to find work for the children in the families of their clients when the children reached the working-paper age. The remark was added, "Two girls of 15 to 16 are attending the Manhattan Trade School. The brighter girls are willing and able to secure factory work on leaving school. There is more hardship amongst untrained boys than girls as they grow older." This comment has an added interest when we note that the organization itself is engaged in relieving widowed mothers, who, presumably, could not earn enough to support themselves or their children.

Seven of the 16 organizations doing organized placement work did not find work for girls under 16, in some cases because they had no calls from employers for such young workers. On the other hand, eight

registered girls under 16, one of which had found positions for as many as 133, and another for 73 girls in the preceding year.

The questionnaire contained several questions intended to throw light upon any attempts on the part of the placement agent to study the abilities of the child and guide it to the work best fitted for it. The entire omission or incompleteness of answers to these questions may be taken as an indication of the lack of realization on the parts of these workers that they are actually undertaking any sort of vocational guidance. It likewise perhaps indicates limited efforts in relating the child to the proper kind of work. It is nearly always a case of any job that may happen to come up for any girl who happens to be at hand. This does not mean that there is any conscious neglect on the part of the worker who is doing her best to assist the child that comes to her for help. Rather it points to the need of a greater knowledge not only of conditions but of how to judge of a person's fitness for those conditions, on the part of the placement agent.

RESULTS OF THE INQUIRY

The inquiry opens the way for some obvious comments. In the first place, the mere fact that so many organizations with such widely differing objects have found it necessary or expedient to divert a part of their limited time, funds, and efforts to such work, emphasizes the need of some organized effort in this direction. One cannot but be impressed with the wastefulness of a system which requires, for instance, that an experienced relief visitor with dozens of pressing cases waiting for her attention and expert judgment, or a busy, capable club-leader, should spend perhaps half a day searching for a job for one person—a piece of work which could be attended to more quickly and efficiently by one whose sole duties would be to find employment, and who could perhaps find jobs for many persons in a half day's search.

Of course, some placement is inevitable on the part of such organizations; but, when a settlement worker, for instance, feels a pressing need to apply conscious effort toward the solution of a problem for which she is but indifferently fitted, whether as a judge of the applicant's abilities or of the conditions and qualifications needed for the job, it would be more economical to have such work left to more expert hands. Moreover, the settlement worker is usually just about as limited in her opportunities for finding an opening for a girl as is the girl herself. The result is that a girl who happens to apply to a social worker

acquainted with a foreman in a brush factory thus becomes a brush maker.

The fact that work places are frequently not inspected or known is a matter for comment. What is a woman likely to know about the wages or workroom conditions of a dressmaker whom she patronizes? The fact that an employer's name is well-known does not, unfortunately, indicate anything about conditions in his office, store, or factory, or the wages he pays. Nor does a visit on the part of a club leader or a teacher to such a factory or establishment before a worker is placed there necessarily ensure placement under good conditions or fair wages. An adequate investigation of conditions, wages, and possibilities of advancement must presuppose a certain amount of knowledge and skilled judgment of conditions and wages prevailing in the community and in its industries, and only the possession of certain standards on the part of the placement agent renders her a fit judge of the standards in a particular place.

ALL GIRLS SHOULD KNOW ABOUT THE INDUSTRIES OF THEIR COMMUNITIES. THEIR LIFE PARTNERS AND THEIR CHILDREN GO INTO THESE INDUSTRIES. ONLY BY A FULL UNDERSTANDING OF THE SURROUNDING CONDITIONS, CAN THEY MAKE HOMES BACK OF THE WORKERS THAT WILL SEND OUT PERSONS WHO ARE TO THE FULLEST EXTENT INDUSTRIALLY EFFICIENT. THEY WILL THUS THRU KNOWING ABOUT INDUSTRIAL WORK GIVE TO THEIR WAGE EARNERS THE SUSTAINING APPRECIATION THAT IS THEIR DUE.—Anna C. Hedges.

SCHOOL AND SHOP METHODS.

FRED D. CRAWSHAW.

NOTE:—The following paper was the basis of an address made at the 1915 meeting of the Western Drawing and Manual Training Assocation. The author was preceded on the program by Professor R. J. Leonard, of the University of Indiana, a transcript of whose address was given in the June number of this Magazine.

Before addressing his audience formally Mr. Crawshaw took occasion to comment upon some of Professor Leonard's remarks as follows: "When I was first asked to speak at this meeting it was to discuss Professor Leonard's paper on 'The Missing Link.' When the program appeared I found that I was to speak upon 'School versus Shop Methods,' whatever that may mean. After listening to the preceding speaker, and knowing as I do what I have prepared upon the topic as printed in the program, I have a feeling that I shall necessarily discuss his paper. First, however, I wish to make a few informal preliminary remarks."

We are glad to give space to both the preliminary remarks and the formal paper in this article.—THE EDITORS.

PROFESSOR Leonard seems obsessed with the thought that anything which is done under the name of manual training is necessarily impractical and lacking in industrial content. He, with all others who labor under a similar delusion, needs enlightenment. They mean well, but thru lack of information they misconstrue facts. In so doing they are injuring not only manual training but industrial education as well.

In the East manual training may still be formal and stereotyped, and consist of making in a dilettant way a fixed series of "jimcracks." Not so in the Central West. Some of the most potent industrial work which is being done in the northern part of the Mississippi Valley is that which we have long called manual training. True it is, "A rose by any other name would smell as sweet."

We must begin to realize that the teachers of manual arts in the regular schools have been doing things during the past few years since the movement for industrial education began. They have been making a remarkable adjustment to the theory that shopwork can be both educational and industrial in character; indeed, for the most part, they have succeeded in making their work thus doubly valuable to a much greater degree than those who have begun teaching industrial work recently, but

who are unfamiliar with teaching methods and the pedagogical significance of shopwork. In this respect history has repeated itself, for in the beginning years of manual training when mechanics were employed as teachers it was found that they could not teach what they knew.

Professor Leonard tells us that all shopwork must be permeated with industrial purpose. I agree with him. But this does not mean that it may not be organized upon the basis of sequential tool operations, as I shall attempt to show. He tells us that boys cannot learn industrial methods by making an individual project. He claims they must make several similar projects to become familiar with commercial shop practice. I believe his contention is fair, but it needs an explanation. He should say more, namely, that the duplication of work is essential to a full understanding of commercial methods, but that this duplication is but a small part of industrial practice. A much larger part is the orderly manner in which a single piece is fashioned with the proper tools and according to the most approved mechanical methods.

Furthermore, a boy may get the full significance of duplication in productive shopwork in making a single project if the method he uses is shaped to this end. Is it not true that in making a table or a stool one has several similar pieces or even pieces of the same pattern to make? If so, may he not fashion them by the commercial shop production method, and by using jigs and forms, if such a procedure is deemed desirable or expedient?

The fact is, Professor Leonard has made the same mistake that some others have made: he has failed to say all that he should. He has erred not so much, perhaps, in what he has said (for he has given us much food for thought) as he has in what he has left unsaid. He, with all the rest of us, needs to be very careful at this time in the transition which is going on in the teaching of industrial work to speak so that what we say may be properly interpreted by those who are actually responsible for the teaching of industrial work in the public schools.

It is the immature teacher, and the conscientious but poorly informed superintendent, who carry theory and prophecy into practice. These people will follow the *letter* rather than the *spirit* of the statements they hear and read. Let us say what we mean and *all that we mean* during this most impressionable period in industrial education.

An example in question is the statement we so often hear that in school shopwork we must follow commercial shop methods. Perhaps we should, but such a bald statement made without qualification is unsafe. Perhaps the following paper will make my point-of-view clear:—

FUNDAMENTAL DIFFERENCE IN APPROACH.

One might begin a discussion of this topic by saying that school methods and shop methods in industrial work are the same. If he did he would be telling the truth but not the whole truth.

The school methods in shopwork must be the same as those in commercial shop practice, so far as essential tools and fundamental operations are concerned, for it must be remembered that school methods originated with shop methods. The essential difference between school methods and shop methods lies in the fact that in the school shop methods have been analysed and developed sequentially for the use of young people in an educative process, whereas in the commercial shop operations have been studied, if at all, from the standpoint of production. Shop methods are likely to be the result of long continued practice in which the emphasis has been placed upon economic return. Operations have been unconsciously and automatically organized and reduced to their lowest number. Or, possibly, if the organization has taken place within the past few years it has been due to conscious effort in the form of scientific management.

Speaking in enducational terms, the practice in commercial shop practice is the result of synthetic action, the accumualtion of parts, or a natural survival of the fittest, if you please; while the practice in school shops may be and probably should be the result of analytical action—one which reduces operations to the form of sequential elements. On the one hand, commercial shop practice is the cumulative result of deduction, whereas school practice in shopwork is the fruit of induction. Generally speaking, the school methods and the shop methods are the same so far as the *thing done* is concerned, but the method of doing may be quite different, as doubtless it should be, for the school method at first, certainly, should take account of two facts which do not enter into commercial shop practice at all:

1st. Young children.

2d. A learning process.

It is a significant fact that in the early history of school shopwork in this country, back in the manual labor movement period, when manual work was done by students merely for economic gain, it failed almost utterly. We speak nowadays of vitalizing manual arts by vocationalizing it. In those early days it was wholly vocational and failed. It needed vitalizing thru a process of analysis to make it sequential and progressive and thus educational. We need to think upon this rather paradoxical

situation today when so many people are crying: "Vocational, Vocational," and when the Manual Arts Committee of the N. E. A. Commission on the Reorganization of Secondary Education has written into its report these words:

> The major purpose of instruction in manual arts is to contribute directly to the vocational efficiency of the pupils. (Secondary school period.)

Before we accept such a statement unreservedly, and in order that we may hope to understand fully its contents, may we think back to the time when manual labor as a form of vocational manual arts was a failure in schools? And may we remember also that shortly following this failure there was and has been ever since successful manual arts. in schools notwithstanding the many statements made by presumably learned men to the contrary? The success was due in no small measure to the close analysis of handwork which was made by such men as Victor Della Voss for Russian manual training, and Otto Salomon for Swedish sloyd.

ANALYSIS OF PROCESSES ESSENTIAL.

And so today out of the din of a battle for industrial education in which the commercial forces have seemed to sweep all before them we begin to hear the faint but sure-to-be-heard cry of the educator: "The thing we need is an analysis of tool operations."

In the last analysis this is not very different from the demand for organized shop development which gave birth to the manual training movement. We need not quibble now over the reason for that demand: —whether it was for logical sequence in tool manipulations for the purpose of developing skill of hand or skill of mind, each of which was the focal point of one of the two early forms of manual training. We need only to note the fact: tool analysis was fundamentally the cause for a successful school shopwork.

May I suggest, therefore, a second significant fact? After thirty-five years of manual arts work in this country, thru which period this form of educational work has been forced to combat the implication that it was not practical, we again face the opinion that what is needed is an "analysis of tool operations."

This time, to be sure, the opinion is that the analysis should be made to determine "common" elements in *different* industrial operations, whereas formerly the analysis was for the purpose of securing a 'sequential development' in *one* industrial or trade operation only.

But is it not perfectly natural that the analysis now asked for should succeed the one which has been made by so many who have earnestly sought to determine a "logical" development in shop courses? And, further, is it not a satisfaction to those who have made the first analysis that the second is suggested as the *sine qua non* by advocates of vocational manual arts, presumably those who believe strongly in industrial education?

I plead guilty to the charge, if it is made, that I have advocated "manual arts for vocational ends" for a number of years past,—in fact before the last industrial education egg was hatched. I will plead guilty also to another assumed charge, viz.; that I believe in industrial education. I do so believe most strongly. Here is my contention, however; that industrial education does not mean industrial practice. *It includes it but it is not synonymous with it.*

Today I fear that "shop methods" means commercial shop practice, which, in turn, means to do any job that may turn up and do it to get economic results. In other words, to do it by the production methods of the commercial shop, using jigs, forms, and the like, to get speed of output.

I believe we may all agree that this is a highly desirable thing to do in advanced classes in which each member has first gone thru a course developed both from the skill-of-hand and skill-of-mind points of view. In other words it is desirable educationally as well as vocationally after the elements in any form of shopwork have been developed and practiced in the so-called craftsman type of work in which one individual does a *whole* job in the most approved mechanical way. If "shop methods" necessarily means "factory methors" then, for one, I approve of them in our schools, even industrial and trade schools, only when they are introduced to further the education and not merely the training of individuals.

The educational benefits of such methods *begin* when those of good individual handwork *end,* and the training element in such methods is confined largely to a familiarity with a "system," not a skilled mechanical process. Howbeit, there may be some *"shop atmosphere"* created by following such methods at any time. In short, then, the *factory or shop method* should be *supplementary* to the school method and preferably *sequential* with it and *following* it.

Perhaps my thought is best expressed in a quotation I select from an editorial in a recent issue of a popular and well-thought-of magazine: "An idle brain is in truth the 'Devil's workshop,' and while we are

giving young people marketable skill in some line of work, we should be sure that we are not at the same time assisting Satan in the establishment of factories."

Let us have "shop methods," "factory methods," or "productive methods," as you will, but let us have them at a time when they mean more to the boy than any other mere "pulling a string or pushing a button" process which means mere routine—the thing that all true manual arts, whether in the form of industrial training or not, must ultimately overcome. Let us have shop methods, but as a part of an educative shop process preceded always by sound, methodical, individual skill-of-hand and skill-of-head work.



MADE BY STUDENTS UNDER DOUGLAS DONALDSON, LOS ANGELES, CALIFORNIA.

BERRY SCHOOL METHODS IN CARPENTRY AND CONSTRUCTION.

GEO. H. KLINGELHOEFFER.

IN the hope that this article may be of some service to instructors of carpentry in other institutions thruout the country, the writer has recorded what has been called the unique method used at the Berry School, Mount Berry, Ga.

To begin with, the school is situated upon a tract of over three thousand acres in the mountainous section of northwest Georgia, a section of the Appalachian Highland where many varieties of timber are abundant. The students are drawn from Georgia, Alabama, Florida, North Carolina, South Carolina, Tennessee, Mississippi, Arkansas and Kentucky. The great majority of them enter the grammar school, as they have had so little previous training. The courses laid before them must, of necessity, be taught so that the student will grasp the principles easily, be interested in what is taught, and retain the knowledge gained.

When the student embarks upon the woodworking course offered at this institution he is first taken thru an elementary course involving simple constructions, thus laying a firm foundation of principles to be used later in the construction of more complex structures. This elementary course is as follows:

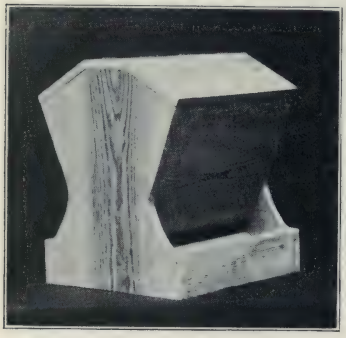


FIG. 1. CHICKEN FEED BOX.

1—Feeding Trough.
2—Crate or Box.
3—Chicken Coop or Feed Bin.
4—Ladder.
5—Barn Door.
6—Picket Fence Gate.
7—Field Fence Gate.
8—Hoe Handle.
9—Axe Handle.
10—Hammer Handle.
11—Single Tree or Double Tree.
12—Wagon Jack.
13—Wheelbarrow.

Some students naturally possess the talent to undertake and accomplish more complicated things than others, so in Exercise 2 the instructor gives the student the choice of making either a crate or a box

and in Exehcise 11 a single or a double tree. Interest is maintained at the highest pitch by permitting the student to deviate from details of the blueprint to suit his taste. The more skilled workman will usually select the more difficult construction. Also, he is allowed to progress as rapidly as he can, as long as he turns out satisfactory work, thus avoiding loss of interest which frequently comes as the result of a student's having to poke along with a backward workman. Each boy must make out his own bill of materials used.

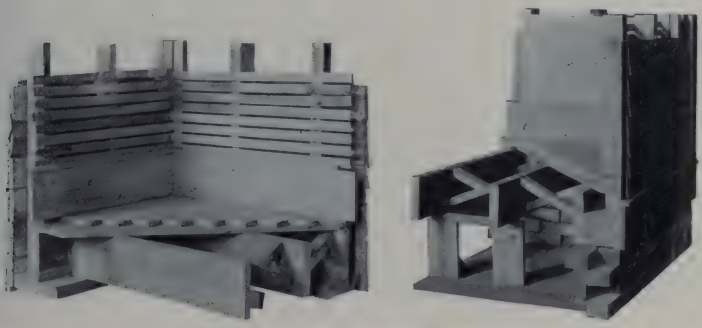


FIG. 2. SECTION OF MODEL COTTAGE.

The course given above, which covers a period of four months, has fitted the boy for more advanced woodwork. He now launches into the realm of carpentry. This course is as practical as it can be made for such a short length of time, i. e., four months. As laid out it involves:

1—Concrete Construction—Concrete Forms.
    (a) Foundations, pillars, steps.
2—Sills.
    (a) Methods of cutting, nailing and anchoring.
3—Walls.
    (a) Corner post, partition post, plates.
4—Rafters.
    (a) Laying out and cutting.
    (b) Hip, jack and straight rafters.
5—Roofing.
6—Weather boarding.
7—Openings.
    (a) Doors, windows.
8—Inside finishing.
    (a) Floors, ceiling.



FIG. 3. BOYS BUILDING A CORN BARN.



FIG. 4. BOYS BUILDING A LAUNDRY.



FIG. 5. BOYS BUILDING A COTTAGE.



FIG. 6. BOYS BUILDING A SILO.

It will be noted that a small amount of concrete construction comes into the beginning of the term's work. This was included because of its close alliance with carpentry, numerous forms being made, while room is left for some originality. After the first principles have been mastered the class builds a section of a model cottage, Fig. 2, under the close supervision of the instructor. This undertaking firmly fastens the principles of carpentry in mind.

During the summer term of school several buildings must be put up, possibly a dormitory, teacher's cottage or barn. At this time the training in the shop becomes valuable both to the student and to the



FIG. 7. OFFICE DESK.

school, the former paying his next year's tuition by his labors, and the latter being able to say, "All work done by the students."

The superintendent of the job in hand sets his group of boys at various tasks. Before very long he is able to determine the abilities of each individual. If a workman is not efficient at one task he is placed at another until he is correctly placed. The instructor makes a pattern of the various pieces, such as a rafter, joist, sill, etc., and after a thoro demonstration of each step, divides the company into groups, with the best workman in each group as foreman. The labor is divided among the group but is so arranged as not to conflict and the foreman is informed that he is responsible for the outcome of the operation which is placed in his hands. This placing of responsibility upon individuals has proven very effective.

In order to avoid too much demolition which must necessarily follow errors in construction, the instructor inspects each operation from time to time, correcting any mistakes and showing the builders how to proceed.

The instructor claims that he keeps up interest by knowing the personality of each individual and then praising him for his work, giving him advice or leaving him alone, as the case demands.

After all, it may be that the method of teaching in this course is not so unique as is sometimes thought, but instead its value may rest in the fact that the boys are taught to do by doing.

Students who wish to continue their course in woodwork for a second year, as all pursuing a mechanical course are expected to do, may do more advanced work in joinery, turning out first class tables, chairs, desks, etc., or they may continue their work with a construction crew until they are sufficiently skilled to hold the position of foreman on a job. In many cases the second year is divided between advanced work in joinery and in the construction of buildings.

Parallel courses in mechanical drawing enable students not only to make working drawings for all of the things which they make, but also detailed drawings for shops, furniture, machinery, and in the second year's work, complete drawings for farm barns, silos and cottages.

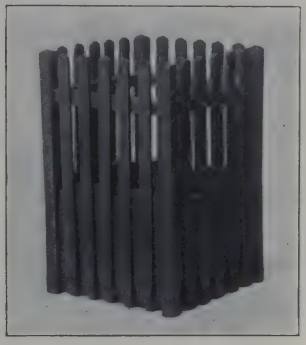


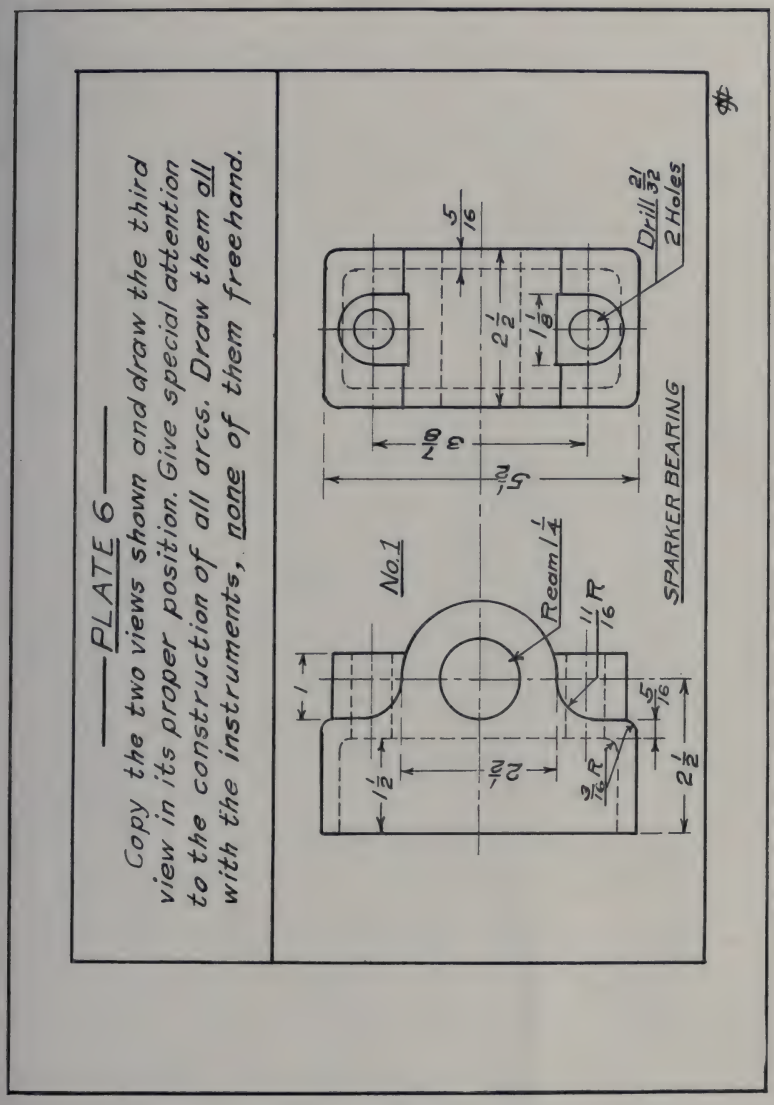
FIG. 8. WASTE BASKET.

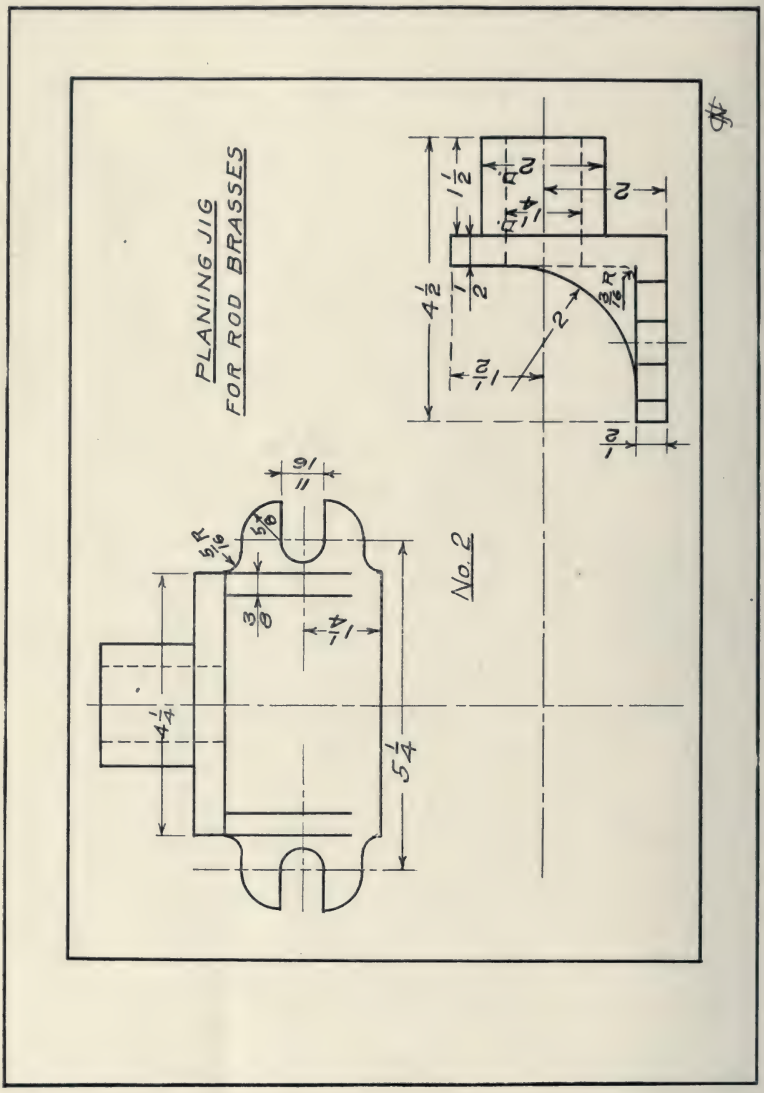
INTRODUCTORY PROBLEMS IN MACHINE DRAWING. —(Continued.)

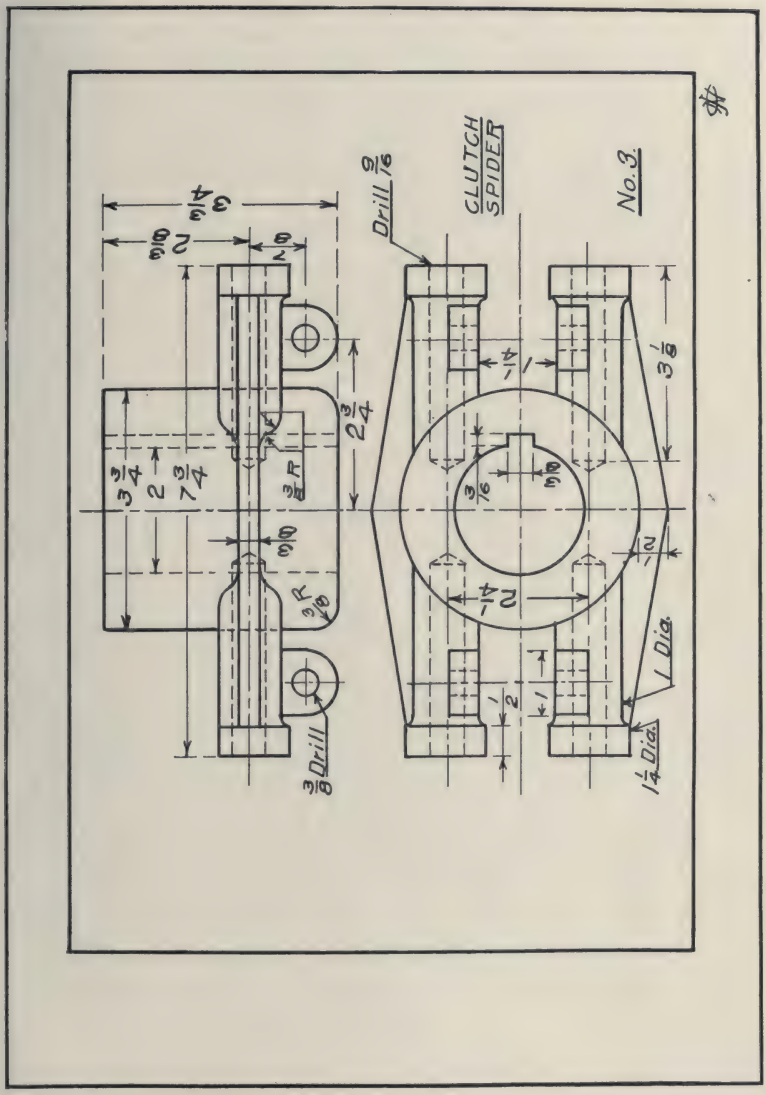
J. Calvin Nicholson.

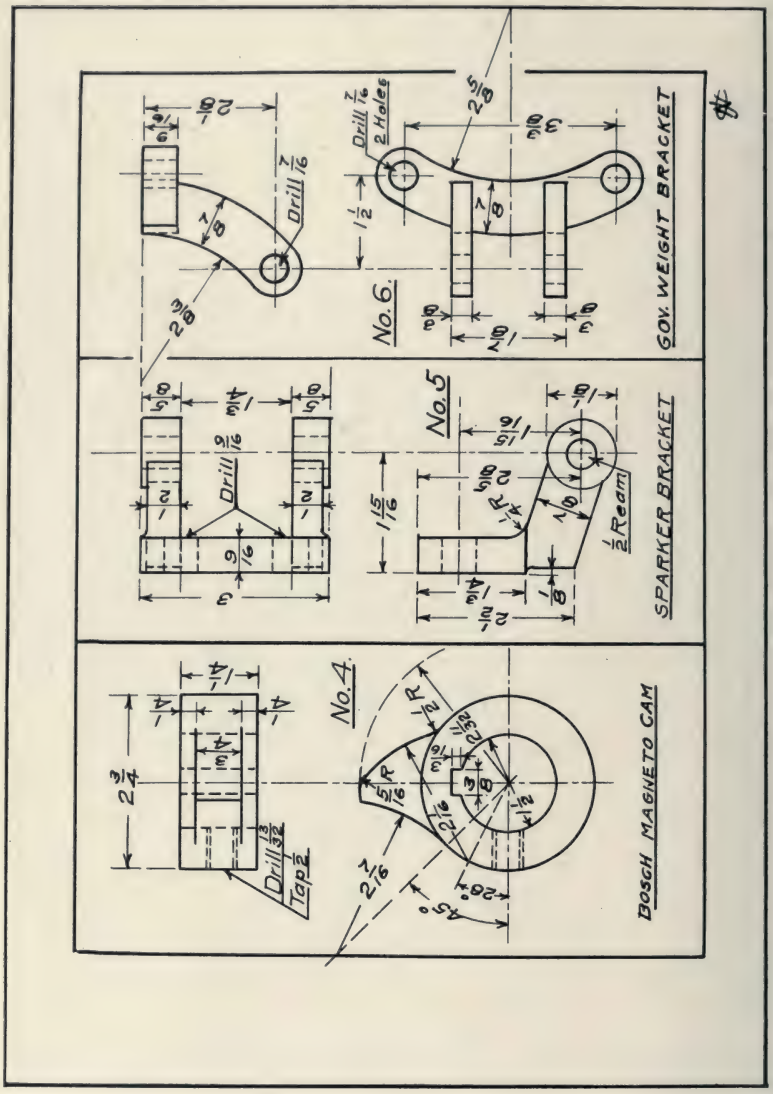
ALL the problems presented thus far have been shown in linear perspective as the clearest way of representing an object to the untrained beginner. But having by this time come to a fair understanding of representing objects by two or more views, the student from here on is given problems by that method, in order to develop skill in reading such drawings, and further ability to produce them. Plate 6 makes quite a leap forward in the subject, demanding the most careful direction by the instructor and downright determination on the part of the student—a fact that it is well enough to let the class know before beginning the plate. However, the task may be lightened somewhat if the right procedure be taken. General instruction before the class will not accomplish very much, but enough of it should be given to enable the student to understand what is required and to see that his first task is to read the mechanical drawing placed before him. Beyond that the instruction must be almost entirely individual and may proceed somewhat as follows:

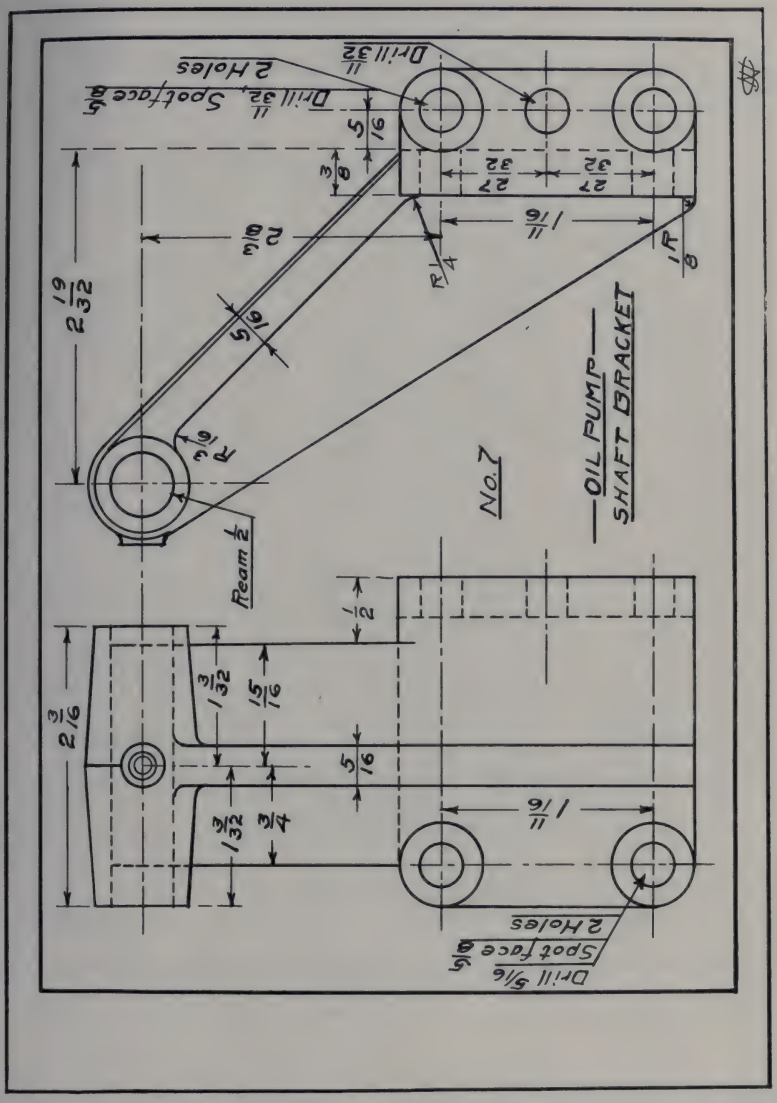
First, the assignments should be made with great care. And here it is well not to press too far the point of assigning different problems to different boys. And further yet, there is not a little to be gained just here in allowing the boys to help each other, since however much one boy may copy from the plate of another, it will be practically impossible for him to do the problem anywhere near right unless he actually understands it. For these reasons perhaps it were well to assign Problem 2 to three-fourths of the class. The actual position of the missing view in this problem is so clear that it has proved the easiest for most students to solve. But here and there in the class will be those who can solve more difficult problems. Number 1 will be found to be a little more difficult than Number 2. In Number 3 the double curve marked $\frac{3}{8}$ R. in the top view, is merely an approximation of the line of intersection between two cylinders. It will be necessary for the teacher to show the student how to find the points where this curve begins and terminates, and to explain that beyond that it is only an approximation, adding also the statement that such approximations are frequent in actual practice. Problems 4, 5, and 6 each requires only one-half a sheet of paper so that

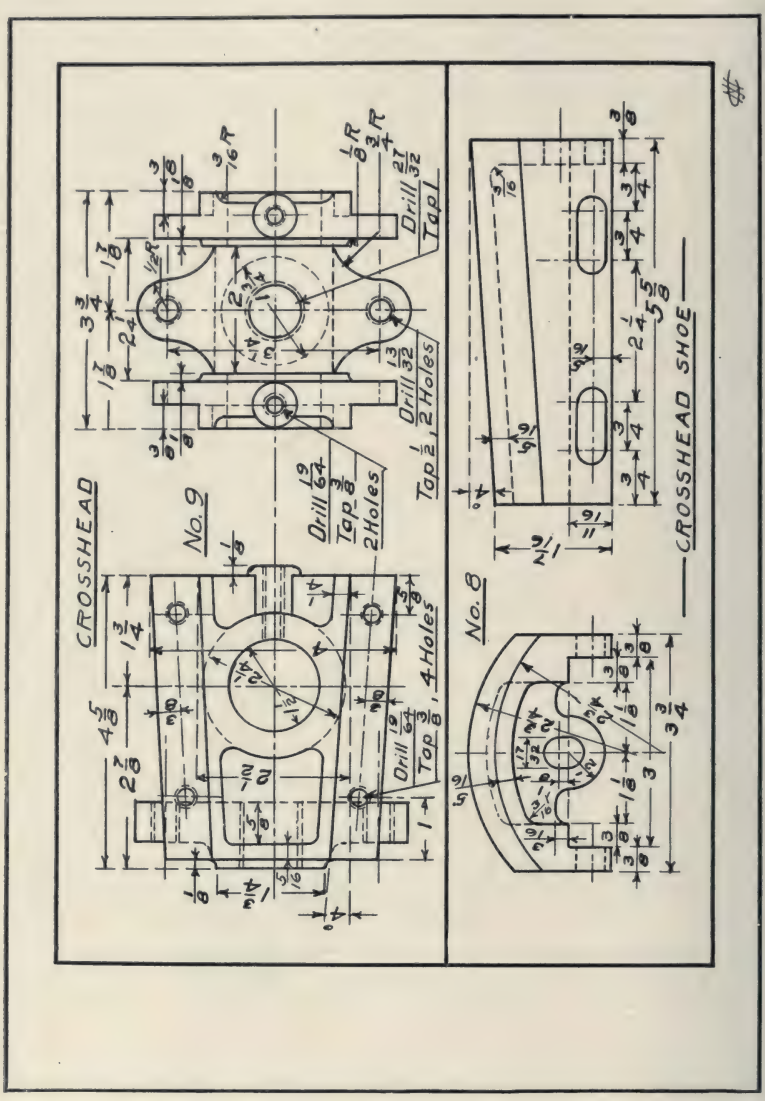

PLATE 6
Copy the two views shown and draw the third view in its proper position. Give special attention to the construction of all arcs. Draw them all with the instruments, none of them freehand.
No. 1
Ream 1/4
SPARKER BEARING
Drill 21/32
2 Holes

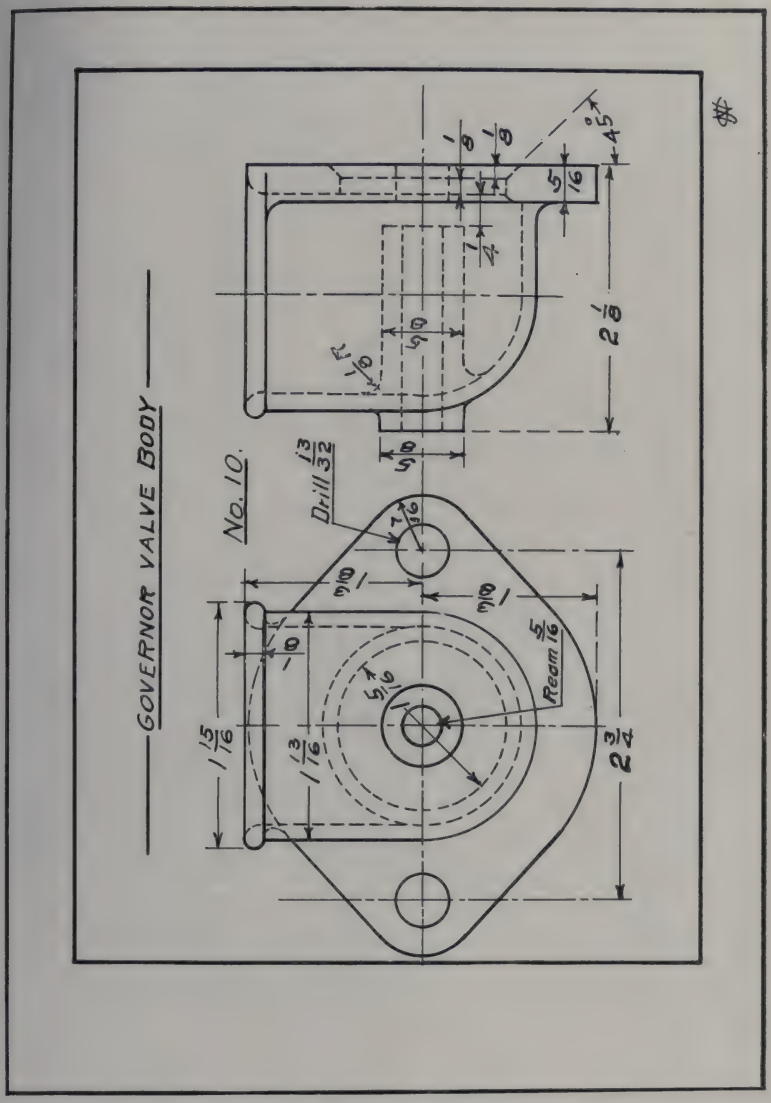

PLANING JIG
FOR ROD BRASSES
No. 2
1 1/2
2
4 1/2
5 1/4
4 1/4
3/8
5/16 R
5/16
3/16 R
1/4
1/2
1/8

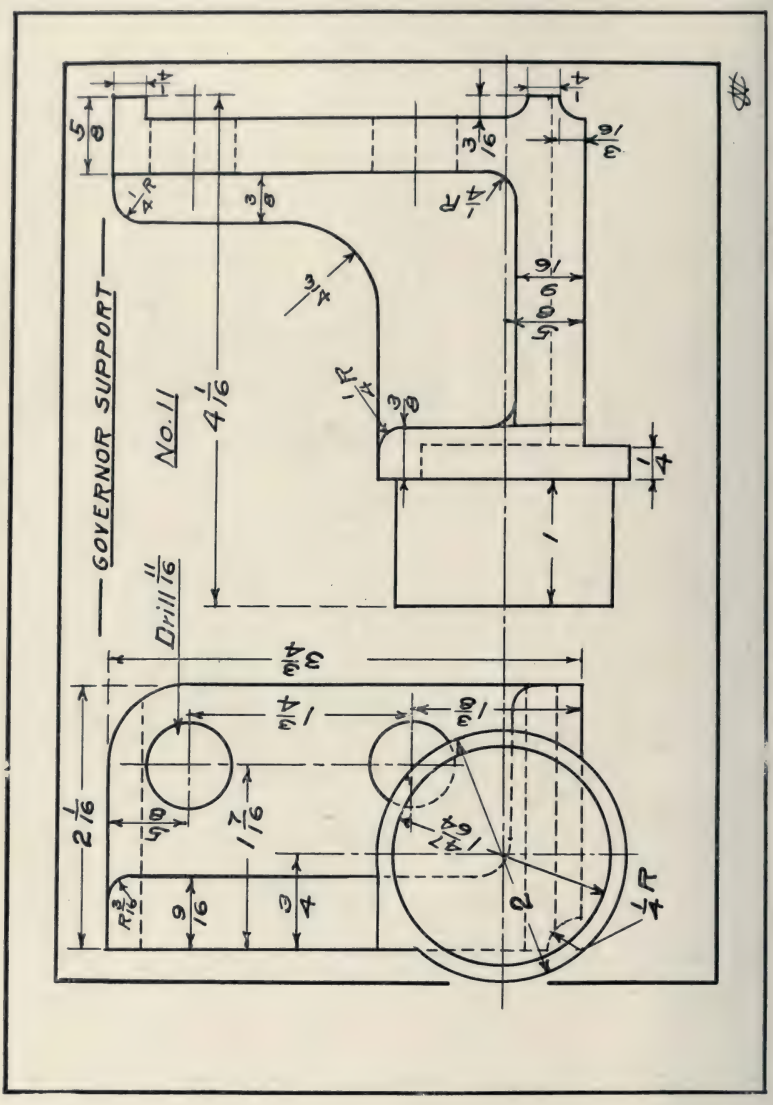

CLUTCH SPIDER
No. 3.
Drill 9/16
3/4
2 3/8
7/8
2 3/4
3 1/4
2 7/8
3/8 R
3/8 Dia.
3/8 Drill
1 1/4
1
3/16
3/8 Dia.
1 1/2
1/2
1/2
1 Dia.
1 1/4 Dia.
3 1/8


GOV. WEIGHT BRACKET
No. 6.
Drill 7/16
2 Holes
SPARKER BRACKET
No. 5
Drill 9/16
½ Ream
BOSCH MAGNETO CAM
No. 4.
Drill 13/32
Tap 1/2
45°
20°


OIL PUMP
SHAFT BRACKET
No. 7
Drill 11/32
2 Holes
Drill 11/32, Spotface 5/8
2 Holes
Ream 1/2
Drill 5/16
Spot face 5/8
2 Holes


CROSSHEAD
No. 9
Drill 21/32
Tap 1
Drill 13/32
Tap 1/2, 2 Holes
Drill 9/64
Tap 8
2 Holes
Tap 3/8, 4 Holes
CROSSHEAD SHOE
No. 8


GOVERNOR VALVE BODY
No. 10.
Drill 13/32
Ream 5/16
45°
2 1/8
2 3/4
1 15/16
1 13/16


GOVERNOR SUPPORT
No. 11
Drill 11/16
4 1/16
2 1/16
1 7/16
3/4
1
1/4
5/8
3/8
3/16
1/4 R
3/4
1 R
9/16
9/16
5/8
1/4
3/4
1/4
1/8
5/16
9/16
3/4
2
1/4 R

two of them may be assigned for one plate. Number 7 is the least satisfactory of the set, yet may be assigned to a boy who thinks beyond the class somewhat, and is both teachable and patient. Number 9 is a delight to the bright boy who is a careful workman; Number 8 not quite so good. Number 10 demands great skill both to read and execute. Number 11, while not hard to execute, is by far the hardest of all to read and to interpret in the missing view. In fact the writer has never had but one student who solved this problem correctly without assistance. If there is in the class a really bright boy who is conceited to his own hurt, here is the place to let him find it out.

Second, be sure that each student has chosen a wise arrangement of views before he begins, but do not suggest a different arrangement without enabling him to see the reason therefor, and where two or more arrangements are not greatly unequal in merit do not press the matter of selection too far. Perfection is not to be hoped for yet, and self confidence on the part of the student is a valuable asset at this point.

Third, see that each student has made the right calculation for spaces before he begins. Having to consider a missing view will present a new difficulty in this matter. Hence if it has not already become the regular practice on every plate to do so, it is well here at least to have the student set down in tabulated form just outside the cut-off lines the height and width of each view and his computations for spacing.

Fourth, do not allow the student to require of himself a full mental solution of the problem before he begins to draw. Always help him to see how much he can draw without thinking at all. Such is the method of approach in actual practice and all thought should be reserved for where it is demanded, which is often enough. Hence in many cases it will be desirable for the student to complete entirely the two views shown before he has even any clear notion of what the remaining view will look like. It will, for the time being, be problem enough for the student to do this alone, since he must be able in the meantime to read all the lines in these two views correctly. However, if while doing this much the remaining view begins to take shape in his mind, so much the better, and better still if this enables him actually to begin drawing the required view before the other two are completed. But the latter is hardly to be expected at this point.

Fifth, this is the first plate in which fillets are shown. Let the boys omit them entirely until the views are practically complete otherwise, then they should be carefully explained both as to purpose and con-

struction, and good workmanship in doing them should be insisted upon strongly.

Before leaving Plate 6 it may be well to acknowledge a fault; namely, that if an object is already fully defined by two views, practical economy demands that no more be drawn. If only all useless and impractical things could be avoided in education! The writer would gladly change Plate 6 to make it conform to that ideal if he could. Meanwhile he can only hope that the temporary wrong concept in the mind of the student may be corrected by subsequent assignments. In some individual cases it may even be avoided by a frank admission by the instructor to the effect that the third view called for is utterly useless from a practical standpoint, but is only a means of securing a better knowledge of the subject; but "useless" things are not very attractive to most boys and one must be chary on this point. Also one may correct the false impression in the brighter boys by assigning them extra problems from Plate 6 to be done in two views only, one of them to be one of the two views given and the other the missing view. But such a procedure would be entirely too difficult to substitute for Plate 6 except in the case of the very brightest. There is left also the further alternative of assigning just after Plate 6 a plate of the aforesaid character to be done by the entire class and embodying also some additional matter. For instance the two views given might purposely be badly selected yet sufficient to define the object when very carefully studied, after which the student would be required to choose and draw two views that fully define the object more clearly or with greater economy of time and skill on the part of the draftsman. And further yet, it is possible to give the student two views of an object that do not quite define it in every detail and supply notes stating the service which these undefined portions are to render and ask the student to determine for himself, according to certain principles such as good form, economy of metal, etc., the best shape for these portions. For instance one may have two views of an object which show by dotted lines a hole for a bolt passing thru a boss, and yet leave wholly unsettled whether the boss is square or cylindrical or of some other form. But the latter suggestion really demands a knowledge of methods in foundry, pattern shop, and machine shop that is quite beyond the student at this point of training; and the former suggestion seems to be a little too much a rehash of Plate 6 to arouse keen interest in these times when there are a thousand distractions all working for the utter destruction of any interest that is far short of the sensational.

(*To be Continued.*)



MORE ART AND SKILL IN MANUAL TRAINING.

W. E. Roberts.

TO the skilled art-craftsman it must be obvious that manual training teachers as a class are more or less deficient in two very important essentials of their profession—technical skill and artistic expression. It not infrequently happens, too, that the greater the degree of proficiency shown in one of these important requirements the less proportionally will be found in the other. It must be obvious, too, that in the field of wood construction, which has been from the beginning the basis of the manual training work in this country, there is a wide separation between art and skill. In this department the products of even the best of our manual training schools and systems are mute and awful testimony to the lack of one or both of these necessary requisites of worthy craftsmanship.

Reasons for this state of affairs are by no means difficult to find. Traditions of the early days of manual training stamped the subject as a thing apart from beauty, and gave particular emphasis to training in technique and skill, expressed almost wholly in unapplied exercises. The educational art work of the period also dealt largely with abstract ideas and gave very little attention to concrete application.

In the later development of occupational work in the schools the two departments broadened their influences along separate lines. In the



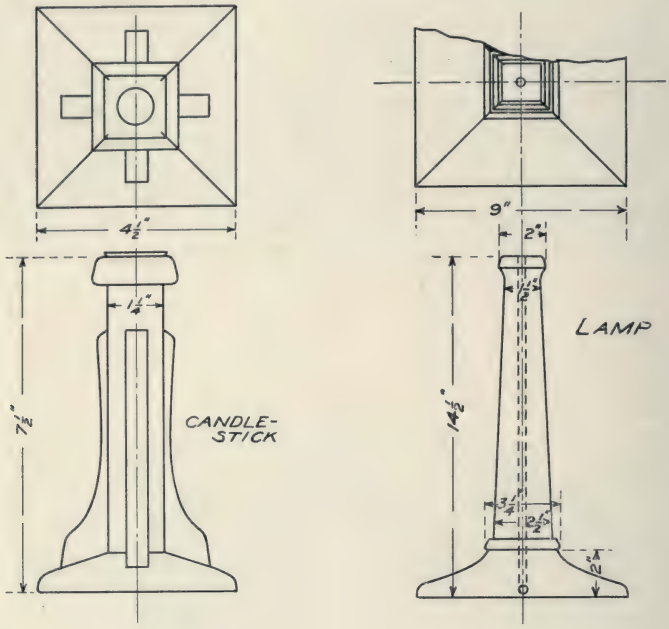








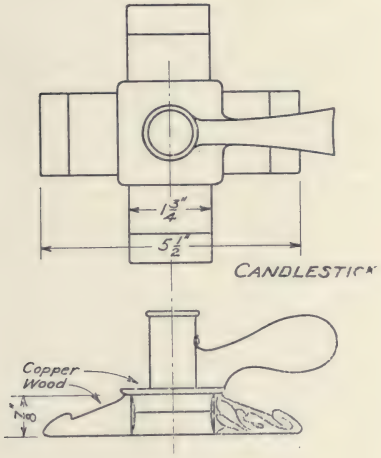
realm of school art abstract ideas gave place to applied design, but the problems were chosen as an application of design rather than as design applied to a utilitarian need, and largely in the field of ornament. In manual training less emphasis was given to abstract skill and more to the use of subject-matter as a means of expression, with the result that skill became a matter of secondary importance and the product of utilitarian rather than artistic value.



In a measure, at least, these faults in manual training work are due to the great demand for teachers of industrial work, which has made it impossible to insist upon adequate training or to fix high standards and ideals of craftsmanship.

But tradition and lack of training are not alone responsible. The situation is in keeping with the spirit of the times. The days of the designer-craftsman have long since passed away, and the constant tendency towards machine-made products and specialization is widening the chasm between individual art expression and skill in production.

The lack of relation between art and manual training in the schools today is almost as universal as at any time in the history of educational handwork. In training schools for teachers the two departments influence each other but little, and in the public schools there are very few if any points at which the art department finds itself disposed or fitted to give assistance to the work in manual training.

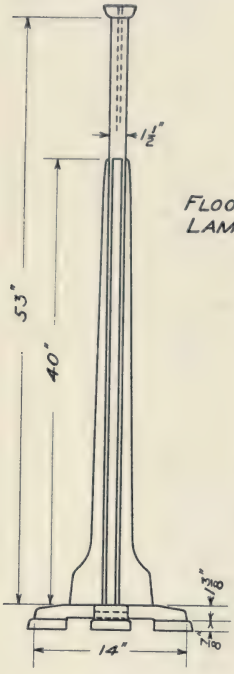


But at best, training schools for industrial teachers can do little more than lay the foundation for future growth along the lines under consideration, for power to express in terms of beauty and skill comes only with long training and experience which the schools for teachers cannot give and which can hardly be acquired by the instructor in his classroom.

In the light of the demands of the arts and industries upon industrial education, both art and skill must be emphasized in the schools if industrial training is to be of value. Much of our present manual training leads directly away from skilled industries by fixing low standards and by cultivating habits of careless and slovenly workmanship which are difficult if not impossible to overcome in later life.

Whatever may be the solution of the problem in the future, at present it must come thru continued development after school training, in the field of work, and the thoughtful and conscientious supervisor or teacher is constantly in search of information and devices that will raise the standards of skill and beauty in his work.

The illustrations and drawings accompanying this article are some of the results of an effort on the part of elementary teachers in Cleveland to meet the problem under discussion. The aim was very frankly that of raising the standards of skill in craftsmanship and appreciation of beauty among the members of this group of teachers.



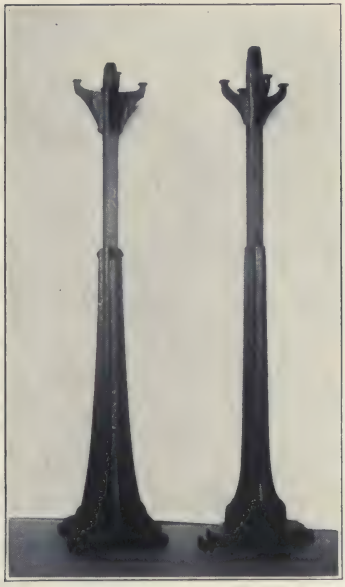
FLOOR LAMP

The organization of the school system makes it possible to hold a teachers' institute of several days duration between terms in the middle of the school year. One of the principal features of these meetings has been the working out of some problem, demanding skill and art appreciation, by individual members of the corps of teachers. In this particular case the problem of lighting was chosen, its variations taking the forms of candlesticks, table lamps, desk lamps, piano lamps, floor lamps, side wall lamps, overhead fixtures, domes, etc.

All available illustrative material, in the form of books, drawings, etc., was brought together for reference. The problem was presented to the group and discussed from the viewpoint of design and construction, and illustrated by innumerable blackboard sketches. Each teacher then worked out a tentative design and working drawing with suggestions and criticisms. The designs were then carried out in actual construction, such modifications from the original being made as the requirements of the case seemed to demand while the work was progressing.

In most cases the projects had to be completed after school work had been resumed. Some weeks later an exhibition of work was held at school headquarters, followed by a teachers' meeting at which the various projects were individually discussed, with criticisms and suggestions for improvement in design. Later each teacher made a tracing of his own project incorporating so far as possible the improvements suggested by the discussion. From these tracings blueprints were made so that each teacher in the group might have the direct benefit of the work of the others.

The meetings and their results were commended by all, and interest and enthusiasm prevailed. Unquestionably the effect was to raise the ideals and standards, and broaden the outlook of those who participated in the work. Not the least of the benefits resulting was the spirit of good fellowship engendered by association in effort to excel.



CONGRESS ON VOCATIONAL EDUCATION AND PRACTICAL ARTS.

GEORGE HENRY JENSEN.

AMONG the numerous organizations holding meetings at the Panama-Pacific Exposition in San Francisco during the past summer was the National Education Association, and among the many sectional meetings was that of the Department of Vocational Education and Practical Arts. The two sessions devoted to this department were held in the Auditorium Theatre in Oakland on Thursday, August 26th. The topic of the morning session was "Vocationalizing Industrial Education" and of the afternoon session "Economic Aspects of Vocational Education."

The first speaker on the morning program was Frank Alvah Parsons, president of the New York City School of Fine and Applied Arts, who spoke on "Art and Its Place in National Growth." He said in part, "Art is recorded in every single thing that man has ever done. It is first of all a quality or a mental trait and cannot be nailed, tied, glued or stuck on to consciousness. So that in the teaching of art, from the point of view of the student, it should not be different from any other subject in the curriculum."

Mr. Parsons then pointed out the fact that much in the present day method of teaching drawing is wrong; that teaching so much insisted upon, is perhaps the least important, except for the few who take up painting as a profession. "What we should teach" said Mr. Parsons, "is adaptation to use. This is the first essential—perfect fitness to use. It applies alike to the flat-iron or the dress, the chain or the table linen, the kitchen linoleum or parlor wall furnishings. Some teach the drawing of flowers that are wonderful from the standpoint of technic,—better leave it alone and teach the girl with carrot-colored hair that she should wear a black ribbon and not a red one."

In a discussion of "Home Economics Applied to Life," Martha Van Rensselear, president of the American Home Economics Association, stated as her premise that the home should be made the laboratory for the study of home economics. In support of her point Miss Van Rensselear said, "The home is the center of our economic life. As long as we forget that the mother in the home is pointing the way, we hinder

the progress of economics. It is in the home that the standards for life are established, and education will advance no farther than the homes of the community in which it is found."

Thomas M. Balliet, dean of the School of Pedagogy, New York University, who has long been interested in industrial training, and has had much experience with vocational education before going to his present position, said in part: "The need of vocational education is today universally recognized. No argument is longer needed in favor of it; the present need is for careful study of methods and detail in conducting and administering it. If pre-vocational training is given the practical minded boy at the age of thirteen or fourteen he will get a much better academic training by the time he is sixteen than in the regular elementary school with the truant officer watching over him."

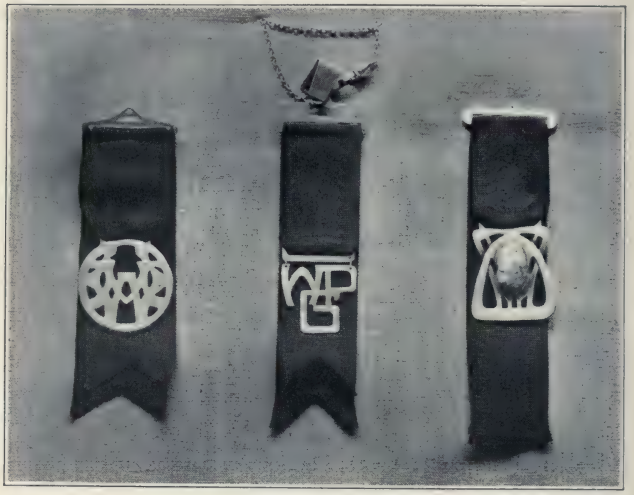
From a somewhat different angle vocational education was discussed by Dr. Richard G. Boone, acting director of the School of Education, University of California, his subject being "The Social Phases of Vocational Education." Dr. Boone made it clear that all education is social. He said "According to statistics, nine-tenths of our population is employed primarily at getting a living; then surely we need industrial knowledge, processes and skill. The school, if not the only, is at least the most available institution for this instruction. The standards of our national life depend on the character of our men; we shall impair the quality of our national endowment if we do not train the majority of our students." Then Dr. Boone showed his broad point of view when he said "To many, not hand-minded, any vocational training is equally as useless as Greek and Latin is to others."

James Collins Miller, provincial director of technical education for Alberta, analyzed in a scientific manner the relations of the school shop to bread winning. "The shop came because the scientist needed it to supplement his laboratory," said Mr. Miller, "and not primarily because of the highly specialized industrialism."

The history of the waning apprenticeship system, which has paved the way for industrial courses in our schools, was traced by Carroll G. Pearse, president of the State Normal School, Milwaukee, Wisconsin. In discussing "Vocational Education and the Labor Problem," Mr. Pearse expressed the consensus of opinion of all students of this subject by condemning the independent short course trade school. As if to sound a note of warning, he asked this pointed question: "Is there serious danger that school training will flood the market?" Mr. Pearse's answer to the question suggests the possibility of preventing such a con-

dition, when he said, "No community should go into this until they have made careful survey of the local industries and demands."

Mr. E. R. Snyder, commissioner of vocational education for California said, "For years we have had long discussions of economic loss because we are not training children practically. The argument that Europe is doing better does not hold in a democracy. In Europe the child is sentenced to establish types of education, while in a democracy the child should be prepared to fill his own special niche." We should try to modernize educational content, by having the public school system turn people out at different periods of time, depending upon the demands of the vocation contemplated.



MADE BY STUDENTS IN THE HIGH SCHOOL AT PORTLAND, OREGON.

THE GARY PLAN ON TRIAL IN NEW YORK CITY.

ARTHUR D. DEAN.

IT is difficult to recall any previous time in New York City when there has been as much discussion over educational matters as now exists. The appearance of so many newspaper articles is largely due to the bringing into New York City of the Gary idea, and the engaging of William Wirt at a large salary to devote one week a month to the promotion of a work-study-play plan of education. The papers have been full of discussions of Ettinger plans (Dr. Ettinger being one of the associate superintendents) as compared with Wirt plans. Issues have been raised, sides have been taken, and, to cap the climax, Comptroller Pendergast fired a shot from a forty-two centimeter gun with the following ten points in mind.

1. School vacations have doubled in the past fifty years.
2. Pupils are in school now only one-ninth of the time.
3. Completion of the elementary course in seven years.
4. Objects to the night and summer school work of a teacher who is paid to work throughout the whole year.
5. Teaching hours ought to be increased to six.
6. The school year increased to forty-four weeks.
7. Compares the salaries of New York teachers with other cities.
8. Endorsement of the Gary plan.
9. Believes a reduction of ten per cent of the teaching staff possible.
10. Promotion on merit, not on a salary schedule. Teacher to stay in the grade where best fitted to teach, and not promoted to a higher grade for sake of salary.

Then President Churchill of the Board comes out with the following statements:

1. Reduction of the course of study from eight to seven years. States that experiments are now being made in two schools for the purpose of ascertaining whether or not it is practicable to save a year in elementary and high school courses.
2. Believes that it is a serious mistake in the school system to provide a stipulated salary increase for years of service and for those who advance to the higher grades and teach the older children.
3. Recommends that the teacher rendering exceptional service in the second, third or fourth year class should be able to secure higher salary and not be lured to a class of older children, largely by the inducement of better compensation.

4. Believes the Comptroller to be unjust in not being willing to provide funds for promotion of teachers in accordance with the schedule provided by law.

5. Does not believe that Wirt intends in his plan any material reduction in the number of teachers to be employed. States that where the Gary plan is on trial at No. 45 Bronx and No. 89 Brooklyn, there has been a material increase in the per capita cost for teachers' salaries.

6. States that Superintendent Wirt, on July 30th, in submitting his plan for the reorganization of the schools of the city, indicates that it was not his intention to increase the hours of teachers' service.

7. Recommends that the Board of Estimate go slow in attempting to force adoption of a longer school day and increase size of class by arbitrarily reducing the teaching staff ten per cent.

8. Does not believe in lengthening the school year, but rather beginning the school sessions in July and August for voluntary attendance.

At present the atmosphere is full of smoke, altho the Public Education Association, through Secretary Nudd, is endeavoring to clear it up.

It may not be amiss to give expression to the following ideas:

The Gary plan calls for several innovations. Among them are the following:

1. All the teaching is, in a greater or less degree, on a departmental basis, and undoubtedly such a plan rests upon a good educational basis, but whether or not the departmental system should be carried out in grades below the seventh is still an open question, although it is certainly true that there are three groups of teachers needed in elementary education:

(1). Those for the ordinary academic studies.

(2). Those for the practical art studies.

(3). Those for physical, musical and other special types of education.

2. There is a substantial lengthening of the school day with provision for pupils to report later than the opening session or to go home earlier. Any musical, art, or other instruction received outside of the school is to be recognized by the school. Under the Ettinger plan it is stated that the schools had not been running more than five hours a day except for those pupils who are in the pre-vocational and seventh and eighth grades. John Martin, a prominent member of the Board, states that it is out of the question for the city to longer finance a single session school.

3. The plan accommodates more pupils thru use of classrooms, assembly halls, work rooms, swimming pools and play ground. It is

stated in the New York Evening Post: "Before the Wirt organization, School No. 45 held seventy-two classes in forty-one classrooms by the use of the part-time system. Now it houses eighty-eight classes on full time, with two hundred and twenty minutes a day for reading, history, arithmetic, language and geography; forty minutes of supervised play; forty minutes for auditorium; and eighty minutes for science, drawing and shopwork, the building being used from 8 a. m. until 6 p. m."

4. Educational agencies other than the school are drawn into active cooperation. For example, the public library, church, Y. M. C. A., social settlement. The religious instruction plan is seriously advocated by John Whalen, President of the American Federation of Catholic Societies and member of the Board of Education. At present forty clergymen and laymen are cooperating, with the Right Reverend Frederick Courtley as chairman. The Episcopal Church has set up a demonstration school on Lawrence Street in connection with Saint Mary's, to train teachers for the schools to be maintained by the churches.

5. School buildings are used evenings, Saturdays and Sundays, gymnasium and pools being open to adults. Sunday, in Gary, for example, the adults meet in the early afternoon for moving picture show and the children later.

6. Play receives due recognition. In other words, play is supervised and the play which usually goes along outside of school courses is brought within. Wirt likes to call his plan a "work-play-study school," where one section goes to the study room for academic work, one section to the gymnasium, one section to the auditorium, one section to the shop, and then change about.

The Ettinger plan is primarily one intended to afford specific vocational instruction to a small, selected group of children in the upper grades. The Wirt plan assumes that the normal education of every child comprehends equal opportunity for work, study and play thru school life from the earliest years. The first is a device for securing pre-vocational training for older pupils; the other is a complete reorganization for elementary school life. To be sure, the Ettinger plan has taken over several features of Mr. Wirt's plan, such as cooperation with neighborhood forces, but it is believed that it differs fundamentally in spirit and method from the Wirt plan.

7. Instruction is given in elementary science. Undoubtedly children of the upper grammar grades would be very much interested and benefited by some form of elementary science teaching, and un-

doubtedly the nature study of the lower grades in a system like New York's might be made to embrace much more than is now possible, when one considers the present subject-matter in its relation to a tenement house environment.

8. Buildings, equipment and activities of the entire school system are used as a laboratory and workshop for practical shop activities. The schools are equipped with printing, plumbing, carpentry, moulding and electrical shops, and the pupils have some opportunity to work in these shops, and many pupils have the opportunity to observe others at work. Shopwork is done on repairs and construction—not for the sake of economy, but simply that the pupils may have real work to do or participate in observing others doing real work.

In the lower grades the pupils are assigned in small groups to act as helpers to those in the upper grades. They are not held responsible for results to the same degree as are the older pupils, because the purpose is simply to enable the younger ones to become familiar with practical processes and to discover their aptitudes without being forced too early to shape their efforts toward an idea of achievement. The problem is primarily for children to discover their vocational interests. Pupils in the lunch-room cook food for the school lunch; children in the commercial department take care of the school accounts; and in the storeroom, of school supplies.

This place is as good as any to state that Dr. Snedden believes that a higher type of teaching is needed to carry out the Gary idea than is necessary in the traditional school.

9. Children find themselves, vocationally. One group, a small one, is "apprenticed" to the practical shop teacher. Under his direction they make repairs on the building—anything from painting to plumbing. These pupils learn the trade. Another group of pupils helps these older ones and observe, and pass from shop to shop or from activity to activity, in this way gaining a vocational interest and knowledge. As a plan for vocational education this scheme has most decidedly its limitations, but as a part of a scheme of elementary general education, it is believed to have great possibilities. Of course it may result in children haphazardly wandering through various vocational experiences without receiving any mental training or any genuine attitude towards work.

10. Mr. Wirt has developed in his administrative program a fine distinction between that training and instruction which, first, should be of definite systematic character: for example, reading, spelling, arith-

metic, foreign language, English, and second, those forms of learning with reference to which no such definite approach is necessary: for example, nature study, story-telling, lectures, practical arts, play, moving pictures, singing and drawing. In other words, there is a sharp distinction between, first, that kind of instruction which terminates in definitely recognized powers and, second, other kinds of instruction or activity work which result in appreciations but not in definite, tangible and measurable powers. The first involves drill in academic practice; the second involves intellectual nurture and growth, from abundant play, practical activities, scientific knowledge, etc.

(The above is largely adapted from Dr. Snedden's speech at Cincinnati.)

11. The Wirt plan does not give every child a seat. It seems unnecessary to give a child a seat under the "new education" with its elements of play, manual training, etc. Neither has every teacher a room. This idea has long been in practice in high schools and colleges and it seems possible to carry it on in the grades, except that it is believed that every child ought to have some one to look to who is his home room teacher. I fear that under the departmental system, children of elementary school age will suffer, unless they have some guiding hand such as the room teacher usually possesses.

12. Monitors or leaders are used, that is, the older girls and boys are used as monitor teachers in taking charge of groups of pupils at games, also backward pupils, the plan being to utilize the desire for leadership of older pupils by arranging a schedule which enables them to care for groups of small children under the oversight of the playground teacher. This has been criticised by Mr. Grady, one of Dr. Ettinger's supporters, as being "aimless play under the benevolent supervision of pupil monitors."

13. Promotion of pupils by subjects and not by grades. Of course this is an excellent plan.

14. Mr. Wirt is quoted as saying that he does not believe in the Ettinger plan of pre-vocational training which he calls "special vocation school hospitals to repair cripples." He believes in the reorganization of the entire school system, in which vocational activities form one of the natural activities of all children. Dr. Ettinger has organized separate vocational school departments, corresponding to grades seven and eight, in Manhattan No. 64 and 95, Brooklyn No. 5, No. 158 and No. 162 and Queens No. 85. In Gary, Indiana, the salary of the shop teachers is charged to the building and repair account and does not form a part of the cost of instruction.

It is certainly true that there has been no evaluation of the result obtained in New York or even those reached in Gary beyond the fact that the children seem to be happier and have better school spirit. This is perhaps due to the play feature or to the freedom of the plan or to the novelty of the scheme, or it may be due to the results which come out of a work-play-study idea in education. It may be that we have found what we have been looking for. Undoubtedly we must keep our eyes open to the possibilities of the work-play-study idea.



SHEET-METAL SHOP, CARNEGIE INSTITUTE OF TECHNOLOGY, PITTSBURG, PA.

EDUCATION FOR WORKERS IN THE CLOAK, SUIT, AND SKIRT INDUSTRY.

WILLIAM T. BAWDEN.

THE details of an industrial agreement of great significance for education for wage-earners are announced in the August, 1915, number of the "Monthly Review" of the U. S. Bureau of Labor Statistics. Since the settlement of the memorable strike in 1910, conditions approximating peace and quiet, in comparison with previous labor difficulties, in the Cloak, Suit, and Skirt Industry in Greater New York, have been maintained thru the operation of a joint agreement between the manufacturers' Association and the unions, known as the protocol of September 2, 1910. In May, 1915, the protocol was abrogated, for a complication of reasons difficult to make clear to outsiders.

A NEW AGREEMENT.

The absolute necessity for some sort of working agreement was apparent to both employers and workers, however, the only alternative being return to a condition of strife and industrial chaos intolerable to both. The leaders of both sides agreed to the appointment by Mayor Mitchell of a council of conciliation for the purpose of attempting a settlement of the differences which had arisen. The council consisted of Dr. Felix Adler, chairman, Charles L. Bernheimer, Louis D. Brandeis, Henry Bruere, George W. Kirchwey, and Walter C. Noyes.

The plan of settlement proposed by the council, which was accepted without change by both parties, and formally entered into on August 5, provided for an agreement covering a period of two years, renewable at expiration for two-years' periods unless either party gives two-months' notice of intention to modify or terminate the agreement. The agreement provides, further, that there shall be no strike during the term of the agreement, defines the right of discharge, establishes a minimum scale of wages in certain particulars higher than that previously in effect, and affirms the right of the workers to organize. The following paragraph from the report of the council formulates a principle of action, the wide application of which would go far toward the solution of industrial troubles.

In the endeavor to work out the plan for a new compact of this sort, the council has laid down the following fundamental rule: That the principle of industrial efficiency and that of respect for the essential human rights of the worker should always be applied jointly, priority being assigned to neither. Industrial efficiency may not be sacrificed to the interests of the workers, for how can it be to their interest to destroy the business on which they depend for a living?; nor may efficiency be declared paramount to the human rights of the workers, for how in the long run can the industrial efficiency of a country be maintained if the human values of its workers are diminshed or destroyed? The delicate adjusment required to reconcile the two principles must be made. Peace and progress depend upon complete loyalty in the effort to reconcile them.

There is now reason for the hope that the adjustment thus consummated will make it possible for appropriate committees of the manufacturers' association and the unions to resume negotiations with reference to the plans for the education of the workers. Plans for the organization of a commission on industrial education for the industry, an apprenticeship system, and an industrial school were developed as a part of the investigation conducted by the Board of Arbitration in 1913-14. The whole matter was necessarily laid on the table some months ago, pending the settlement of the difficulties which arose.

THE NATIONAL CLOAK AND SUIT COMPANY'S SCHOOL.

In the meantime, however, other forces have been at work, and a school actually started by the National Cloak and Suit Company, one of the members of the Cloak, Suit, and Skirt Manufacturers' Protective Association. This school is part of an extensive plan devised by Dean Schneider, and involves the cooperation of the board of education, represented by Dr. John H. Haaren, associate superintendent in administrative charge of cooperative and continuation classes.

Three types of instruction are provided in the school of the National Cloak and Suit Company:

1. *Cooperative classes,* in which two groups of fifteen girls each from the Newtown and Bushwick high schools alternate weekly between the high school and the factory.

2. *Continuation classes,* in which about 150 employes of the Company, in six mixed classes of young men and women, are taught arithmetic, grammar, geography, spelling, penmanship, hygiene, home nursing, and current events, by teachers under the control of the board of education.

3. *Vocational classes,* forming the bulk of the work of the school, in which nearly 600 employes receive definite instruction designed to instruct new employes, to increase individual efficiency, to facilitate promotions, and to enable employes to shift to work for which they are better adapted, or which they may find more congenial.

At present the vocational classes cover nearly 40 different lines of work, the enrolment in each class being limited generally to twenty. The instruction is outlined on a basis of one hour per day, in units ranging from one week, 5 hours, to three months, 60 hours. All classes are conducted during business hours, and workers receive full wages while in school.

The teachers usually have four classes daily for five days per week, the remainder of the time being spent in preparation for classes, and in correcting examination papers and other written work. The school is also the center of the office system of the business, and the teachers prepare bulletins of instruction for all classes of employes, and thus have general supervision of the maintenance of efficiency.



CHART SHOWING FLUCTUATIONS IN COST OF THE PRINCIPAL BUILDING MATERIALS BASED ON DATA COMPILED BY THE BABSON'S STATISTICAL BUREAU. REPRODUCED FROM HODSON'S MAGAZINE.

EDITORIAL COMMENT

A NEW school as well as a new store needs to advertise. Publicity of the right kind is essential to success. The technical school at Hamilton, Ontario, has adopted a method this fall that is bearing fruit. A number of the larger stores in the city agreed to display exhibits of the work of the school and to mention these exhibits in their respective advertisements in the newspapers. Perhaps this co-operation helped the stores as much as the school, but it certainly helped the school to become better known. This method of publicity may be a suggestion to some other school.

THERE is food for thought in the report of the Illinois Tractor Demonstration held early in August at the University of Illinois. Thirty-one manufacturers of tractors, at their own expense, gave demonstrations in actual field work. On the first day there were 3,000 visitors, on the second 7,000 to 8,000 and on the third day when twenty-eight tractors, all of different makes and types, plowed 80 acres of land, there were 12,000 people to witness the demonstration. This is another instance of practical cooperation between business and educational interests, accompanied by some very effective educational advertising.

A DIFFERENT device for advertising a vocational school has been adopted in Holyoke, Mass. It is the old catechism method applied in a new field. Here are the questions and answers sent out by the head of the school:

What does the vocational school teach?

Carpentry; (b) cabinet making; (c) machine-shop practice; (d) pattern-making; (e) printing; (f) steam engineering.

How can a boy decide which trade he is suited to?

A trial period is allowed in any trade selected by the boy and his parents. If the boy does not succeed at the first trade selected he may change to another.

How long will it take the boy to finish a course?

That depends largely upon the boy. Some boys may complete their course in two years. Some boys will need three and one-half years to finish the course.

How does the boy secure a job after he has completed his course?

The school thru the head of each department keeps in close touch with the needs of employers and makes every effort to find positions for boys.

Can the boy earn money while attending school?

Yes. By taking the two-years course in the school, and then taking the part-time course, he works one week and goes to school the next. Those who take

the three and one-half years course in the school earn full wages during the last half of the fourth year.

Of what advantage is it to a boy to learn a trade?

His earning power is greater than that of the boy who depends upon finding a job without training.

Does a boy learn anything beside his trade?

Yes. The boy studies English, mathematics, history, science, civics, and has all the advantages of physical training.

IN harmony with its well-known progressive policy, the University of Wisconsin has this year added four courses in manual arts and vocational education to its Correspondence Study Department. These make it possible for a teacher working for a degree to do a portion of his work in manual arts *in absentia,* or for any teacher of the manual arts who desires to increase his efficiency on the professional side to do so thru home study. This extension of the manual arts work, however, does not and should not include shopwork. It covers only the special pedagogy of the manual arts and vocational education, including the history and literature, teaching supervision and organization of the manual arts, and vocational training and guidance. These courses will be a boon to many teachers who are really desirous of becoming acquainted with the literature of the subjects offered, and to feel that they possess a measured standard amount of knowledge of the pedagogy pertaining to the subjects they teach.

THE high schools of St. Louis have adopted a new time schedule which will increase the capacity of the schools from 20 to 25 per cent and increase the efficiency of the laboratory subjects, manual training, mechanical drawing, and art work by 33 per cent. This has been brought about by adding forty-five minutes to the school day, thus making possible four double periods or eight single periods instead of seven each day. This is a move which other schools may well follow. It does not mean any longer hours in school for all students, but it does give a better chance for all double period work.

MASSACHUSETTS has a law requiring every city containing 20,000 inhabitants or more to maintain the teaching of manual training as part of both its elementary and its high school system. The last census reveals the fact that the city of Northampton has passed the 20,000 mark, and now faces the problem of complying with the law. This case attracts more than usual interest because an independent in-

dustrial school, the Smith's Agricultural School and Northampton School of Industries, in the city has been willing to give the manual training instruction to high school students. This kind of cooperative plan, however, does not meet the requirements of the State Board of Education. It has been decided that the presence of a state-aided independent industrial school in a city does not operate to relieve the city of the necessity of complying with the law requiring it to maintain manual training courses in the high school.

This situation seems to have called forth some discussion of the difference between manual training and vocational training, and the reasonableness of allowing the latter as a substitute for the former. As there is no penalty provided for failure to comply with the law the matter may remain unsettled for a time.

A DIFFERENCE IN POINT OF VIEW.

SEVERAL weeks ago we received a copy of *Women's Wear* a trade newspaper published in New York City which contained a story that caught our attention. A Western merchant was in Boston trying to secure a teacher of salesmanship who had been trained by Mrs. Lucinda Prince. The merchant, Mrs. Prince, a Boston store manager, and the writer of the story were at luncheon together. As the luncheon proceeded the store manager, who for years had known Mrs. Prince and her methods, said to the visiting merchant:

"Why do you want one of Mrs. Prince's teachers?"

"To increase the efficiency of my sales force," was the reply.

The store manager met this with a quizzical smile, and then asked:

"Why do you want to do that?"

"So they'll sell more goods," was the reply of the now puzzled merchant.

"And what's back of that?" the store manager cross-questioned. "Why do you want them to sell more goods?"

"To make more money."

The merchant was slightly vexed at the persistency of this questioning on a subject which seemed clear enough to him. The store manager, however, relentlessly went on:

"For the firm?" he suggested.

"Of course!" was the frank response.

The store manager shook his head and then, speaking swiftly and wtih great firmness, he said:

"It's no use! Don't bother Mrs. Prince. She can't help you. You'll never find any way to make your people want to make more money *for you,* but when you come to the point where you want them to make more money for *themselves,* they'll *do* it—*and they'll make you rich while they're doing it.*"

We hope that this store manager's point of view is the one that prevails among business men who are interested in vocational education.

COOPERATION WITH OUT-OF-SCHOOL EDUCATIONAL AGENCIES.

THE judgment of observers concerning the importance of various aspects of educational development inevitably is influenced by the closeness of their relationship to the events under review, and to a certain extent by their own sympathies and theories of education. For this reason, pronouncements of opinion, and especially predictions as to the future outcome of observed tendencies, should be put forth with reasonable modesty and reserve. So far as our observation goes, there is at present no force or principle of action more influential, or of greater significance for the cause of popular education, than the spirit of cooperation between the schools and various agencies outside the schools.

A new conception of education is coming to the consciousness not only of the schoolmaster but of the citizen, and there is taking place a mutual readjustment in appreciation of responsibility. It has been suggested, and the suggestion has been acted upon with salutary results, that the factory, the labor union, the commercial establishment, the woman's club, the parent-teacher association, and other representative groups, have cooperative responsibilities with the public school in the education of children and youth. The idea that all of these forces, with the public school as coordinator and active leader, have something to contribute to the solution of educational problems, and especially in the field of vocational education, is causing almost a revolution in educational thinking.

Naturally there are those who experience difficulty in applying old formulas to new data, and in readjusting their thought processes to a changing point of view. There is also a certain amount of intellectual disinclination to make the necessary effort to comprehend a new proposition or a new method. Then there is a third group of those who are rationally opposed to that against which they raise objections. When due allowance is made for the influence of all the forces of conservatism,

the progress that has been made within the past few years in joining diverse interests in cooperative effort must be regarded as nothing less than remarkable.

Vocational education programs lend themselves more readily than others, perhaps, to the influence of cooperative activity, and for this reason much has been accomplished in the study of occupations, analysis of the requirements of both workers and employers, and the development of courses of study for vocational schools. Many other departments of educational activity, however, will be found susceptible to the new influence, and ready to profit by the injection of ideas suggested by the new point of view.

In numerous cities, of which Rochester, N. Y., and Chicago are conspicuous examples, trade agreements have been entered into which actually affect the status of the boy as an apprentice to his trade, and his progress toward independence as a journeyman workman. The formulation of a number of such agreements, as reported in this MAGAZINE, constitutes one of the significant services rendered by the vocational education survey now in progress in Minneapolis. An analytical study of this special form of cooperation, with full outlines of the terms and conditions of the contracts, will prove a most valuable contribution. Doubtless such a report will be available in connection with the Minneapolis convention of the National Society for the Promotion of Industrial Education, in January.

ENRICHING ELEMENTARY SHOPWORK.

PHILADELPHIA is attempting to solve one of the big problems of manual training in elementary schools. A circular has recently been sent to each teacher of elementary shopwork, the opening paragraph of which is as follows:

> It is intended that every boy in grades 7 and 8 shall have an opportunity, weekly, of doing some practical work in or about the school plant for the school, his home or himself. It is desirable that the boys shall have a diversity of work to do and that their work shall appeal to them as being eminently necessary and worth doing. Many opportunities arise in the school and home for simple constructive and repair work involving a number of trades and materials.

This is a recognition of the growing belief that the manual arts work of the elementary schools should not be confined to woodworking and a little mechanical drawing, but that in some way it should give the broader and richer experience which can come only thru experience

in working with other materials, some of which seem to be just as important in modern life as is wood. Iron, copper, clay, concrete, paper and cloth, are essentially different from wood, yet all of these are important industrial materials. Furthermore, while the elementary processes of woodworking are fundamental and typical of work in other materials, there are other processes which by the very nature of the material cannot be learned even by analogy in the woodworking shop. There is no process in woodworking which corresponds to that of modeling in clay, nor tempering steel, nor hammering up a copper receptacle. Planing and sawing and chiseling belong to many materials, but they are not the only fundamental tool processes in industry. Moreover, the fundamental processes of planing, sawing, and chiseling are not adequately known thru experience in one material only. The elementary schools should lay a broader foundation than that represented by wood alone.

But to solve this problem is not easy. There is danger that the multiplication of processes and materials may be accompanied by a corresponding lack of thoroness in the instruction given. There is danger that the habits formed in the use of tools may be less correct and less valuable than when only one material and one group of processes is undertaken. There is also a danger that teachers in elementary shopwork may fail to possess that added power of organization and practical and pedagogical skill which is necessary to carry out successfully a program such as seems to be suggested in the Philadelphia circular.

With all these dangers, however, we are confident the problem will sometime be solved, perhaps in several ways. Some teachers will organize the work so that each natural group of processes and materials—each trade—will be studied intensively, even as woodworking has been studied in the best school shops in the past. For example, printing and bookbinding, with paper as the chief material will furnish the problems for the sixth year; woodworking for the seventh year, and metalworking for the eighth year. Others who value habits of technic less, and the leadings of individual pupils more, will teach all three in the same shop all the time. Still others will combine these two points of view and will endeavor to devise means of organizing shopwork to meet this combined viewpoint.

Whichever the viewpoint the success attained is bound to be measured very largely by the capacity of the teacher. This fact has been recognized in Philadelphia, and the following announcement made:

In order that the teachers of elementary shopwork may be able to supplement their experience in the woodworking trades so as to direct the diversity of boy work which is open to our pupils, the following two years' schedule of classes for such teachers has been arranged:

SCHEDULE OF CLASSES.

FIRST YEAR.

	Hours per Week.
Term I.	
School Shop Management	1
English	1
Drawing	1
Wood Finishing	1
Term II.	
School Shop Management	1
English	1
Drawing	1
Shop Mathematics	1

SECOND YEAR.

	Hours Per Week.
Terms I and II.	
Teaching Methods	1
Vocational Education	1
Short Technical Courses	2
Bricklaying	6 weeks
Concrete Work and Plastering	6 weeks
Electric Wiring	6 weeks
Miscellaneous Repairs,	6 weeks

ADMISSION TO CLASSES.

Classes are open only to teachers of elementary shopwork in the public schools of Philadelphia and to those whose names are on the eligible list for appointment to such positions. Attendance at these classes by persons whose names are on the eligible list carries with it no guarantee of appointment as a teacher of elementary shopwork. The instruction is given under the direction of the Board of Public Education, and is free of charge. The second year of work is open only to those who completed satisfactorily the course offered last year to teachers of shopwork.

HOURS OF INSTRUCTION.

Classes will be in session each week on Thursday from 4:30 to 9:30 P. M., with an intermission of one hour, from 6:30 to 7:30 for supper. For all who desire it an a la carte meal will be served at cost in the building. The classes will continue over a period of twenty-four weeks, beginning on Thursday, September 30, 1915.

REGISTRATION.

Every person entitled to enter these classes will receive an admission card with this circular. This card should be presented to William C. Ash, principal of the Philadelphia Trades School, at 17th and Wood Streets, at 4:30 P. M. on September 30, 1915.

OF CURRENT INTEREST

THE GARY SYSTEM IN NEW YORK CITY

THE Gary plan has won an important victory in New York City. Comptroller Pendergast has committed the board of estimate to the new system of school administration.

The principal recommendations made by the comptroller are as follows:

1. The total elimination of any increase in the budget of the board of education for 1916. This means a saving of about $4,000,000.
2. The total elimination of part time and overcrowding in the schools. This is accomplished by intensive use of school buildings as they exist. New construction will be limited almost exclusively to new districts or where present buildings are in bad condition.
3. The extension of the school year from 40 weeks to 44 weeks.
4. The lengthening of the school day from 5 hours to 6 hours.
5. The total elimination of extra pay for service in vacation schools, and other forms of extra pay for persons employed on annual salaries.
6. A reduction of 10 per cent. in the number of teachers' positions. This is made possible by lengthening the school day and the school year.
7. A change in the system of promoting teachers, whereby merit alone shall control. This means the eradication of the system of paying teachers more for service in seventh and eighth grades, and the substitution of a plan whereby each teacher shall teach the classes for which she is best fitted.
8. The reduction of the common school course to seven years.

In discussing the report the comptroller said "Of course the idea of improving the school service is and must continue to be paramount, but here, as often happens, increased efficiency and economy go hand in hand." He contends that the Gary plan has proven to be practical in two schools in New York, and that it should be generally adopted. The saving in money comes chiefly from the fact that where seventy-two teachers were required under the old plan only sixty-four would be required under the Gary plan. The increase in efficiency comes from the enrichment of the training due to giving more time and better facilities for library work, physical training and instruction in the manual arts.

METHOD OF PROMOTION AT THE SPRINGFIELD VOCATIONAL SCHOOL.

In the Vocational School, Springfield, Mass., there is no definite

time fixed for promotion from the course or from any part of the course. Each of the five trades taught in the school is divided into six or seven stages. "To be promoted from one stage to the next it is required of a student: (1) that he show proficiency in all of the operations classified under his present stage; (2) that he complete the assigned technical and classroom work; (3) that he make proper application for promotion from the present stage to the next." (4). The approval of the entire faculty of the department concerned must be gained before the certificate of promotion is granted.

To illustrate the arrangement of courses by stages the following outline of shop practice is given for the department of carpentry:

Probationary: Very simple construction, small boxes, getting out duplicate pieces to dimensions, etc. Soft wood.

Elementary: Use of jigs and fixtures to get out good grade of work in quantities. Tables, trays, drawers, etc.

Elementary Medium: Use of hand tools without use of jigs. Simple assembling, lay-out work, etc. Soft wood. Trays, jumping standards.

Medium: More difficult lay-out work, assembling, etc. Dado, rabbet. Simple jobbing. Repair work.

Medium Advanced: Some machine work. Partitions, paneling, some joining.

Advanced: Good quality of work on difficult jobs in house construction, inside finish, etc.

Commercial Standard: Work that requires commercial standard of workmanship and finish.

A NEW METHOD OF EVALUATING INDUSTRIAL WORK FOR COLLEGE ENTRANCE CREDIT

A rational basis for giving college entrance credit for manual training and vocational handwork has long been sought. A letter from H. E. Speece of Meadowlands, Minnesota discusses this subject and presents a point of view which, if not conclusive, may open the subject for further discussion. Mr. Speece first points to the generally accepted fact that colleges should give credit for high school industrial work. Then he recognizes that the greatest difficulty lies in the fact that there is no uniformity of courses in industrial work; hardly any two schools are pursuing exactly the same course. This becomes a great difficulty not because it would be impossible to make them uniform, but because they ought not to be made uniform. To demand uniformity in such courses would be to deprive them of some of their excellencies. It is therefore necessary to seek some basis other than uniformity. Mr. Speece

says that each school is teaching certain fundamental principles and processes which at first sight appear to furnish the desired basis for a system of credits. On further consideration, however, he concludes that this basis has important limitations. It is not only essential that a project involve certain specified processes and the application of certain principles, but the project, he says, should be made in response to a need that is felt by the pupil. This requirement complicates the problem.

To get around this difficulty Mr. Speece would not center his evaluation upon principles and processes taught but would base his credit estimate on the (1) time spent in industrial work, and (2) a pupil's "masterpiece," shown by photograph, "together with a record of time and materials consumed in making the project and an explanation of all help from instructor or other pupils." Mr. Speece believes that "if such record were submitted to the college when applying for credit, the college would seldom have ground for complaint." The field of industrial training would be "divided into units, each unit to receive one credit, and the number of credits a student may elect to be decided between the high school and the college. Such units would be woodworking, forging, machine shop practice, concrete construction and brick laying, or any other trade that has a body of fundamental principles and processes, and human interests sufficient to justify its being taught in the public schools."

TEACHING MANUAL TRAINING IN PORTO RICO.

A communication from William H. Nelson who is teaching manual trianing in Caguas, Porto Rico, gives some of the high lights and shadows of teaching manual training on a tropical island which is feeling the pressure of enforced enlightment.

He says:

Manual training is taught in the seventh, eighth, ninth and tenth grades, one hour daily for five days per week. As the shop is located in the school building, no time is lost in coming and going. The subject has been taught here for three years, but as the majority of the boys change schools every year, the work this year was of a very elementary character. In fact, I found the boys in the seventh grade much better prepared—last year the subject was taught in sixth grade also—than either the eighth, ninth or tenth, the last two grades having no foundation on which to build. The partial reason for this is that by the time a Porto Rican boy passes to the ninth grade he considers himself just a little too good to work with his hands, especially when he has to remove his coat to do so.

As I have the boys from the ninth and tenth grades in one group, I have started them all on mechanical drawing and, except for the slowness of some, I am having very good work in this subject. We have a course of study arranged

by the supervisor of manual training for Porto Rico. This is given to the boys lesson by lesson, they having to copy it in their note-books and make simple drawings of the project. As there are supplementary problems under each project, the class can be kept fairly well together.

As all of our lumber is native sawed by hand out of hard native trees, you can get some idea of the work required to dress it down to dimensions. The stock is anywhere from ⅝″ to 1½″ thick and any width and length. The woods are beautiful in color—all the way from yellow to almost black. All projects are finished in natural color with prepared wax.

There is not much chance for an instructor to do more than follow the course of study, as we are changed around every year and it takes nearly that length of time to learn your boys, especially the boys here.

Manual training and domestic science are not liked by the people nor by most of the children. Every year the Legislature either reduces the wages of the special teachers or the number of schools where the subjects are taught. Some of the boys like the work, and I would like nothing better than to pick a class of eighteen and teach them some woodworking vocation. I have about that many who work as fast and as exact as any boy in the States, and they behave themselves much better.

THE FATHER OF TRADE SCHOOLS.

The memory of Milton P. Higgins has been honored by the presentation of two fine bronze tablets, the work of Buelah Pratt, of Boston, which have been placed by his family at either side of the entrance to the Trade School for Boys' at Armory Square, Worcester, Mass.

The presentation exercises were attended by an audience of representative men and women who heard addresses calculated to inspire them wtih a feeling of pride in the part which Worcester has played, under the leadership of Mr. Higgins, in the making of educational history. The keynote of the meeting was the productive shop as an essential factor in successful trade training, and Mr. Higgins's use of that feature in the plan of the Worcester school.

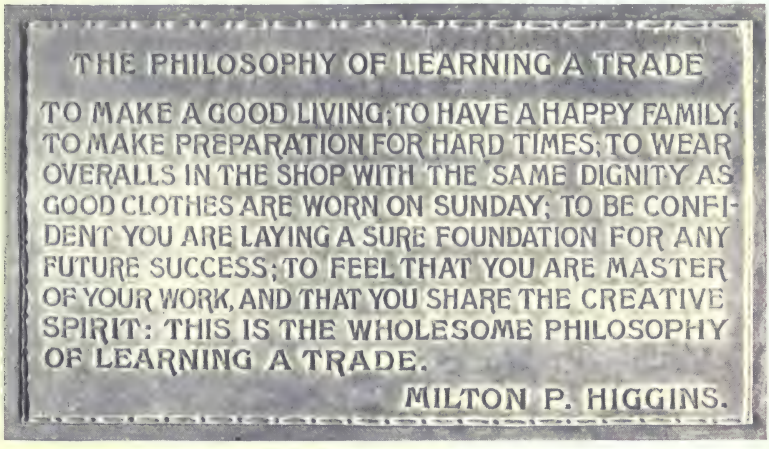
Aldus C. Higgins presented the memorial tablets on behalf of his family. He outlined briefly the events which led up to the founding of the school, and the principles which his father always stood for, whether in connection with the Polytechnic Institute, where he spent the first twenty-eight years of his business life, or in connection with the Trade School, which was the culmination of the thought of those years.

Prof. George I. Alden, life-long associate of Mr. Higgins in school work and in business, accepted the gift on behalf of the Board of Trustees. He dwelt at some length on the fact that in all history we find that it is the human element that lives longest. We find that the greatest monuments of all time are those not to victorious armies, but to

the men who have made the deepest impress on their times by their advance in peaceful pursuits.

Dr. Hollis, president of the Worcester Polytechnic Institute, spoke, not as an old acquaintance, nor even as an acquaintance at all, but as a





man who in taking up his work at the Institute found the impress which Mr. Higgins had left upon it. The commercial shop, at the time when the Washburn Shops were opened, was so entirely an experiment that even Ichabod Washburn with all his confidence stipulated in his deed of

gift that if it should be found impracticable to conduct the shops on the lines which he laid down that the endowment might be diverted to other uses. President Hollis pointed to the fact that the Washburn Shops were made a success along the identical lines which have since been found adequate for the training of skilled mechanics in the Trade School, and that the same idea has been transplanted to other schools, but has often failed in other places because of the lack of men of the power and virility which Mr. Higgins brought to his work.

The principal address of the evening was delivered by Dr. David Snedden, Commissioner of Education of the State of Massachusetts. He spoke feelingly of Mr. Higgins as the man on whom he was able to lean when he first came to the state, some five years ago, in matters relating to industrial education. He had found him to be a typical American citizen of the best kind, and in his aspirations, a leader. He typified individual achievement coupled with a maximum of social service. Devoted to practical work he nevertheless exalted education as an American ideal.

VOCATIONAL TRAINING PROGRAM FOR WASHINGTON, D. C.

The superintendent of public schools in Washington, D. C., Ernest L. Thurston, has recently expressed the opinion that the several experiments in vocational training in the Capitol city have pointed out the way that should be taken, and that the time has come when such training should be placed within the reach of every student. He has proposed the following program:

> Additions to the courses at the Business High School of such branches as salesmanship, and later of the more technical branches of business training, such as store management, decorating, advertising, and efficiency accountancy.
>
> Gradual transformation of the McKinley Manual Training High School from a preparatory school for technical colleges to a school which shall teach such vocations as wiring, electrical engineering, patent attorney work, and drafting.
>
> The establishment in every section of the city of a pre-vocational school.
>
> A gathering of figures for a period of four or five years to show just what Washington grade and high school pupils do after they leave school.
>
> A survey of all the occupations open to pupils in Washington and the vicinity with a view of adapting the vocational courses to the needs.
>
> The extension of manual work in all grade schools, even in those which will remain in the academic category."



ARMORER'S WORKSHOP, RIGGS GALLERY, METROPOLITAN MUSEUM OF ART, NEW YORK CITY.



VISE IN ARMORER'S WORKSHOP. LENT TO MUSEUM BY AMBROSE MONELL.

WHEN THE CRAFT AND THE ART OF IRON-WORKING WERE ONE

The June bulletin of the Metropolitan Museum of Art, New York City, contained illustrations of the armorer's workshop in the Riggs gallery of the Museum, accompanied by a brief descriptive article. Thru the courtesy of the Museum authorities we are permitted to present to our readers larger reproductions from the original photographs. These show some very unusual examples of fine craftsmanship in iron and steel. They show to what extent the art impulse affected the master workers of the Middle Ages even in such a resisting and common material as iron.

The workshop is framed in splendid Gothic woodwork which was once the rear of the courtyard of an early sixteenth century house. In the back of the shop is the workbench, which is a restoration of a Mediaeval design. At the front of the bench, in the foreground of the picture, page 233, is a block for stakes "which is known to have served for several generations of armorers." At one end of the bench is a remarkable vise which is shown in larger size on this page. "This dates from the early seventeenth century and is of North Italian workmanship." This is "a vise which might have been used by an artist who prepared the locks and mountings of enriched pistols and harquebuses." On the bench and in the rack beyond the bench is a variety of stakes, hammers and other tools, most of them very old. In the collection are "matrices by means of which borders were rolled over or pressed into the forms of roping which one sees so frequently in armor of the sixteenth century."

"The most important object" in the collection is the "anvil, richly wrought which dates from the sixteenth century, if not earlier. It is probably of Italian workmanship." The anvil and the vise do not belong to the Museum but to the collection of Ambrose Monell of Tuxedo. The quality of the anvil suggests that it was used "for work of the costliest character, that gold or silver may have been beaten upon it; but its large size, massive construction, and roughly worn and hammered surface indicate altogether that it could not have belonged to a goldsmith. We know, moreover, that anvils of similar shape have been pictured for iron-workers. Thus one of them appears in a portrait by Hans Memling in the Hopital Saint Jean in Bruges and two others were painted by Breughel in his Vulcan's forge. So we justly conclude that the present object with its elaborate ornamentation could have been used only by an iron-worker and an iron-worker of quality—which means, in all ancient rules, an armorer."



ANVIL IN ARMORER'S WORKSHOP. LENT TO MUSEUM BY AMBROSE MONELL.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

ANNOUNCEMENT

In order to stimulate the making of worth-while projects in various lines of manual arts work the editors will open a series of competitions. These will be announced from time to time. The winners' names and the projects will appear in future issues. The first competition is designed to create a greater interest in birds and bird houses. Drawings, photographs and descriptions of bird nesting houses, feeding houses, etc., are desired. The competition will close December 20, 1915. A jury will award prizes as follows:

First prize, $10.00. Second prize, $5.00. Third prize, $2.50.

Honorable mention prizes of $1.00 will be awarded to as many as the jury may deem worthy.

DRAFTING TABLES.[1]

Two years ago, drafting tables suitable for the needs of college mechanical drawing classes were designed and built in the Industrial Department of the State Teachers College, Albany, N. Y. The construction of these tables not only offered suitable woodworking projects, but involved, in some degree, factory processes of manufacture such as occur in furniture making and similar industries. The accompanying drawings show this table in detail.



DRAFTING TABLE—SHOWING FRONT, BACK AND END.

The top is designed with ample room for drawing-board, reference books, instruments and models, and should be made of clean white pine glued up in 8 strips each 1⅛″x4″x46″. A stationary tilt of approximately 3 degrees makes it more convenient to work on.

[1]The material in this issue was contributed by Harry B. Smith, director, Department of Industrial Education, State Teachers College, Albany, N. Y.

STOCK BLL FOR DRAFTING TABLE.

Description	*No. Pieces*	*Dressed*	*Rough*
Legs	5	1⅝"x1⅝"x37¾"	2"x2"x38"
Girts	2	1⅝"x1⅝"x24½"	2"x2"x25"
Girts	2	1⅝"x1⅝"x39½"	2"x2"x40"
Girts	1	1⅝"x1⅝"x18½"	2"x2"x19"
Stud	1	1⅝"x1⅝"x31¼"	2"x2"x32"
Bolster	2	1⅝"x1⅝"x30⅞"	2"x4"x31"
Back Girt	1	1⅝"x3¾"x39½"	2"x4"x40"
Top	1	1 "x32 "x46 "	1⅛"x34"x48"
Drawer Front	2	⅞"x4 "x17½"	1"x4½"x18"
Dust Panel	2	⅞"x18½"x26"	½"x22"x14½
			⅞"x2¼"x7½"
Locker Bottom	1	⅞"x17½"x23½"	1"x18"x24"
Locker Partition	1	½"x25 "x20¾"	1"x25"x21"
Bolster	1	⅞"x3¾"x23½"	1"x4"x24"
Drawer Bottom	2	⅜"x24½"x17 "	½"x25"x18"
Drawer Sides	4	½"x4 "x25½"	1"x4¼"x26"
Drawer Backs	4	½"x3⅜"x16½"	1"x3¾"x18"
Doors	2	¾"x7¾"x20¼"	¼"x4¾"x16½"
			¾"x2"x51"
			¾"x3¼"x6"
Back Panel	1	¾"x17½"x29¾"	2¼"x4¾"x23¾"
			1¾"x3"x108"
End Panel	2	¾"x23½"x29¾"	2¼"x7¾"x23¾"
			2¾"x3"x29¾"
			2¾"x3"x17½"
			1¾"x3"x23¾"
Cleats			½"x¾"x16′
Moulding			½"x½"x26′

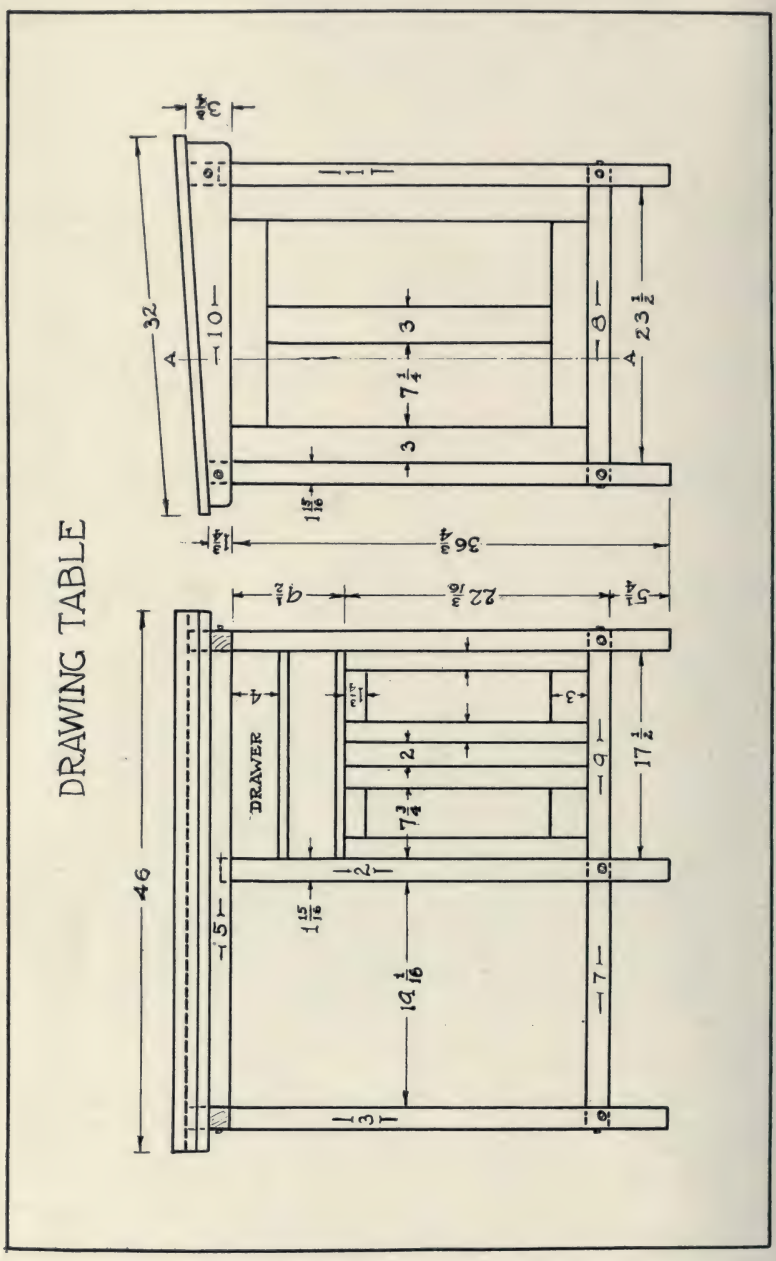
HARDWARE SUPPLIES.

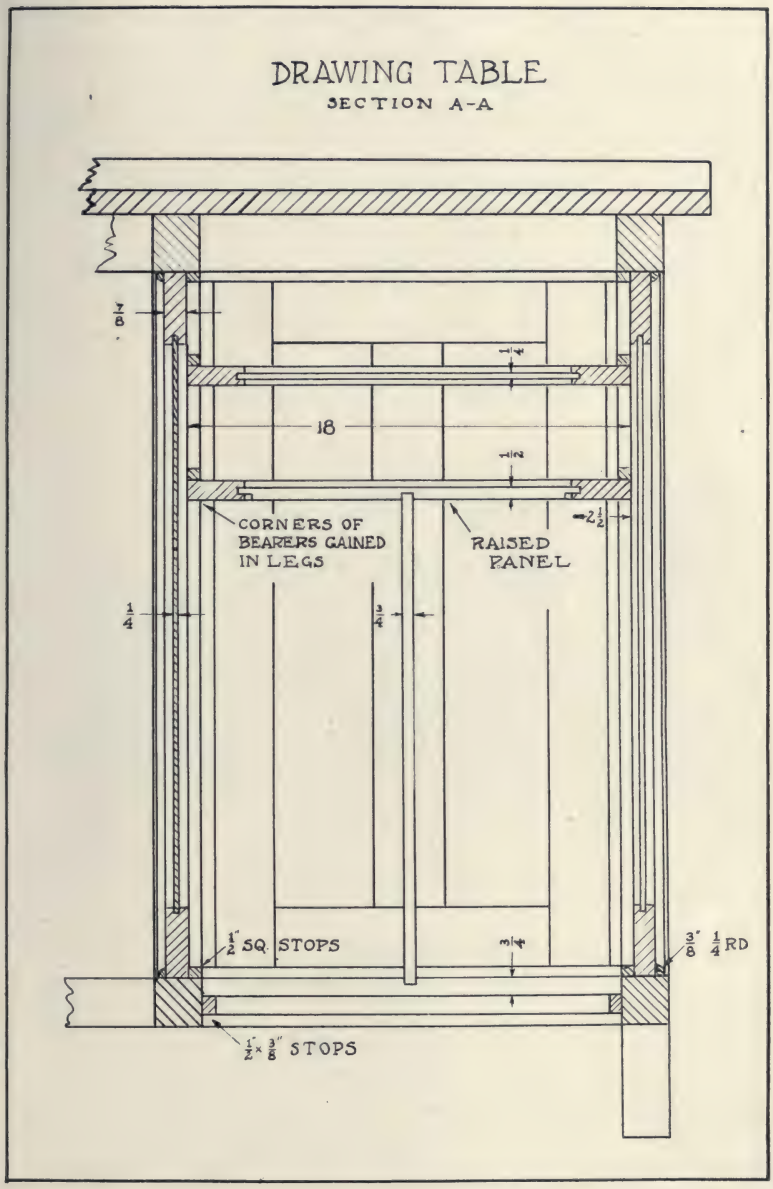
15, ⅝"x4½" Sq. Hd. Bolts.
½ Doz. No. 14, 3" Flat Head Screws.
4 Dietz No. 51 Locks.
4 3" Butt Hinges.
2 Drawer Pulls.

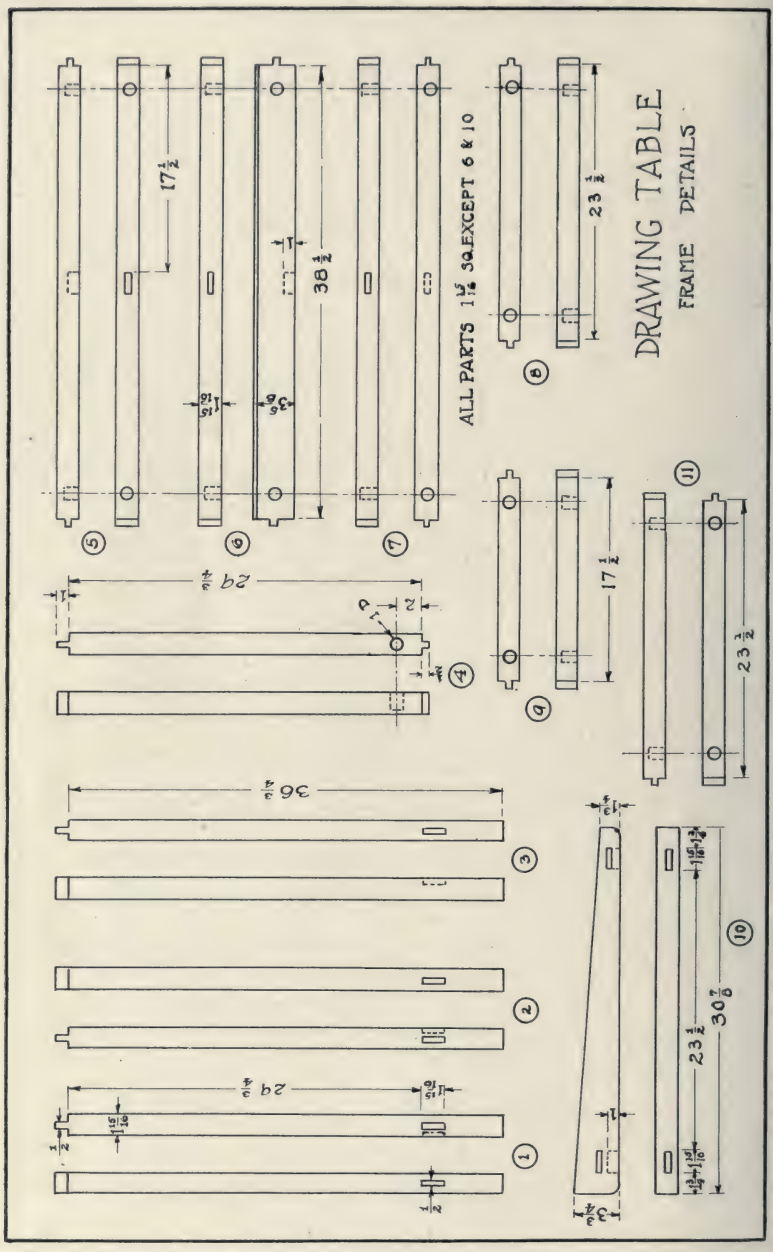
The top is fastened to the frame with eight No. 14 wood screws, four on each end; length of screws to suit conditions. See item 10, page 240.

The screws were counter sunk. Two of these screws were subsequently covered by right hand panel, and therefore the top should be fastened in place before the panel is inserted. Due allowance should be made for shrinking and swelling by enlarging the holes on the upper side.

Plain white oak is best for the frame and for panel work. The frame joints are secured by means of draw bolts, (⅝"x4½") machine bolts, except those with 1" tenons which are glued with mortises.


DRAWING TABLE
DRAWER
32
46
36
22
23 1/2
17 1/2
19 1/16
7 1/4
7 3/4
1 15/16

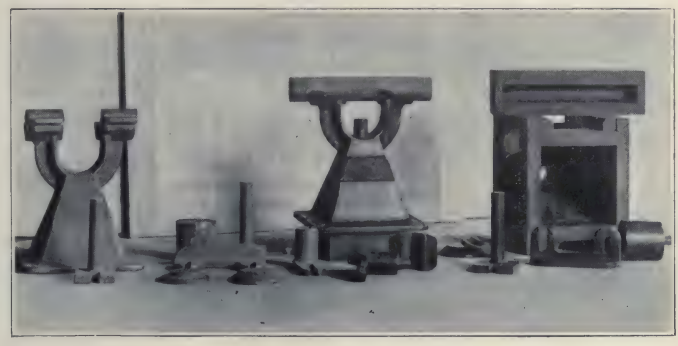

DRAWING TABLE
SECTION A-A
18
CORNERS OF BEARERS GAINED IN LEGS
RAISED PANEL
1" SQ. STOPS
3/8 1/4 RD
1" × 3/8" STOPS


DRAWING TABLE
FRAME DETAILS
ALL PARTS 1 5/8 SQ EXCEPT 6 & 10
17 1/2
38 1/2
23 1/2
24 3/16
36 3/16
30 7/8
23 3/4

Drawers and lockers are inclosed with panels, built up to suit the frame spaces and fastened in place against stops; the joint around the outside is covered with quarter round molding. Dust panels are inserted in drawer bearers entirely separating each compartment. The corners of bearers are gained into the legs. The lockers are designed for boards 18″x24″ with T-square, etc.

Both drawers and lockers are equipped with master keyed Dietz No. 51 drawer locks for ⅞″ wood. The cost for master key is very little, and the convenience very great.

The tops are finished in natural wood color with two coats of shellac or cabinet varnish. The frame and body are finished to suit the trim of the drawing room. Johnson's wood dyes and paste wood fillers were used on these benches, with two coats of good cabinet varnish—first coat rubbed with No. 0 steel wool, and second coat with rotten stone and light machine oil. The result was very satisfactory.

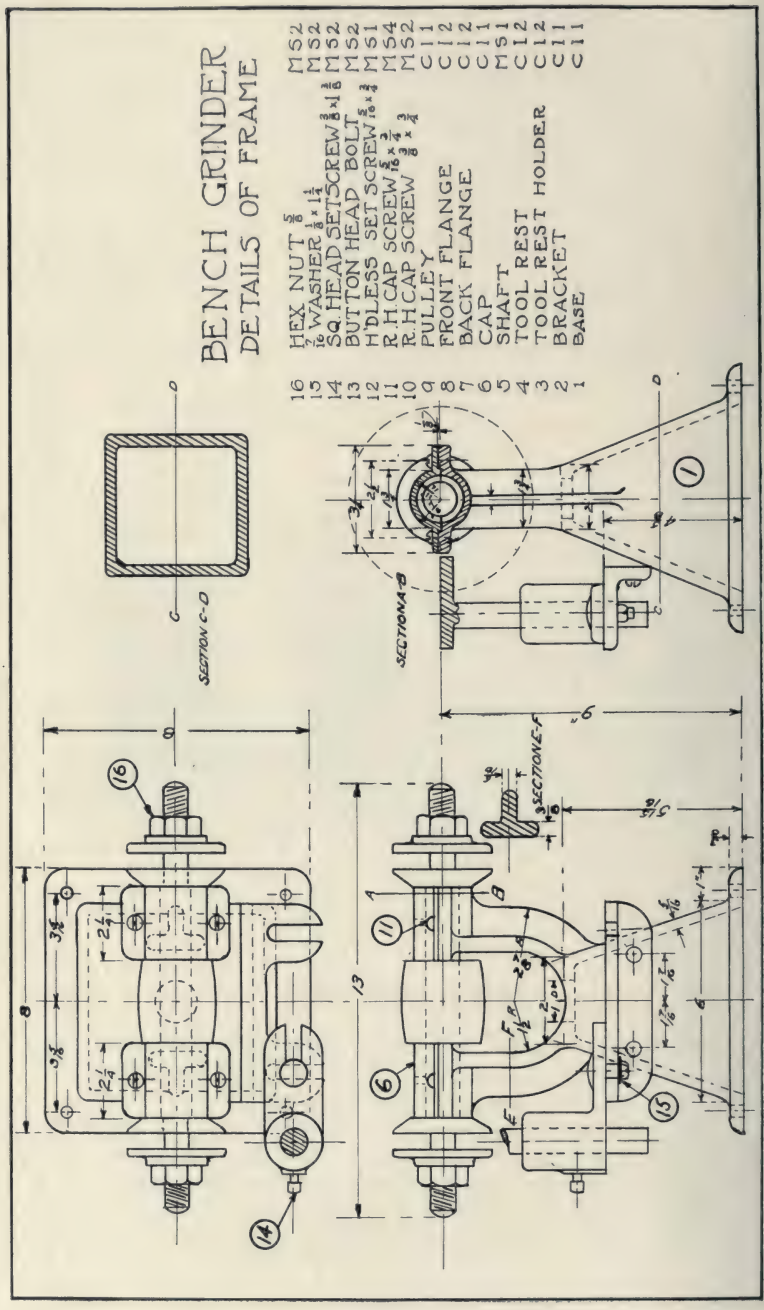


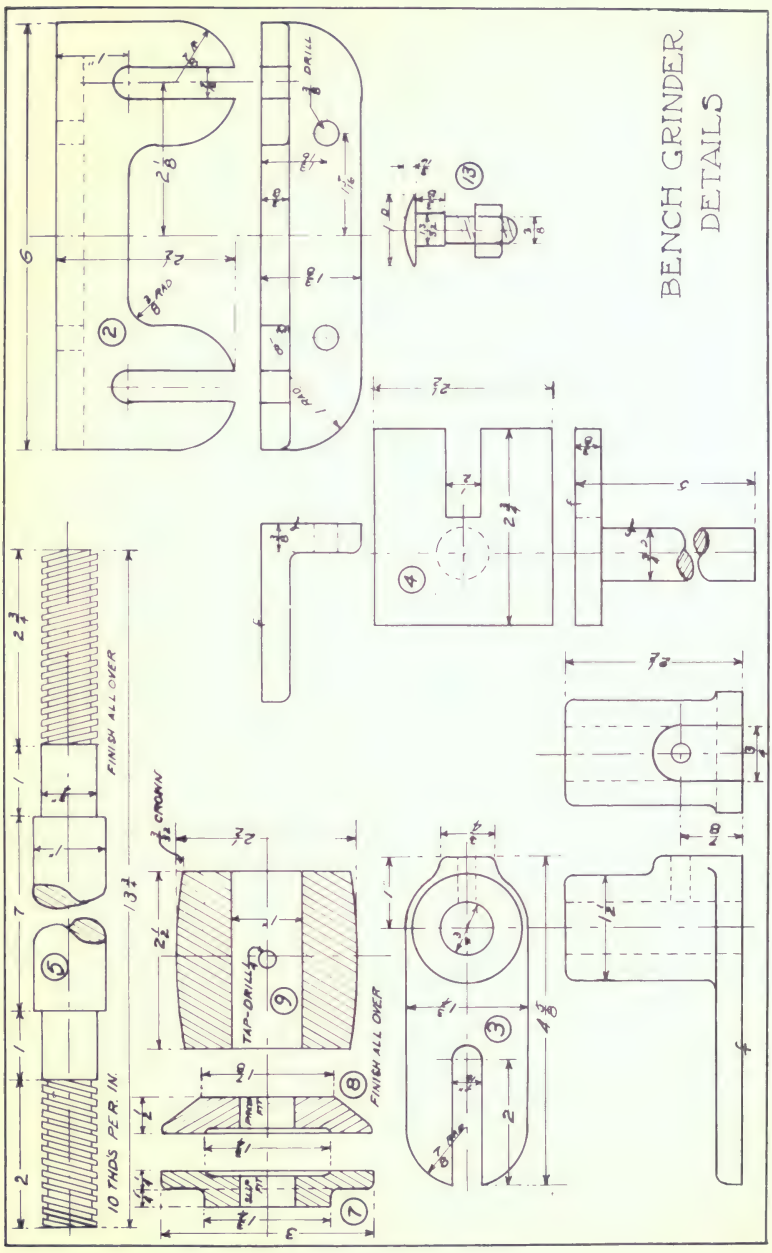
BENCH GRINDER—CASTINGS, PATTERNS AND CORE-BOX.

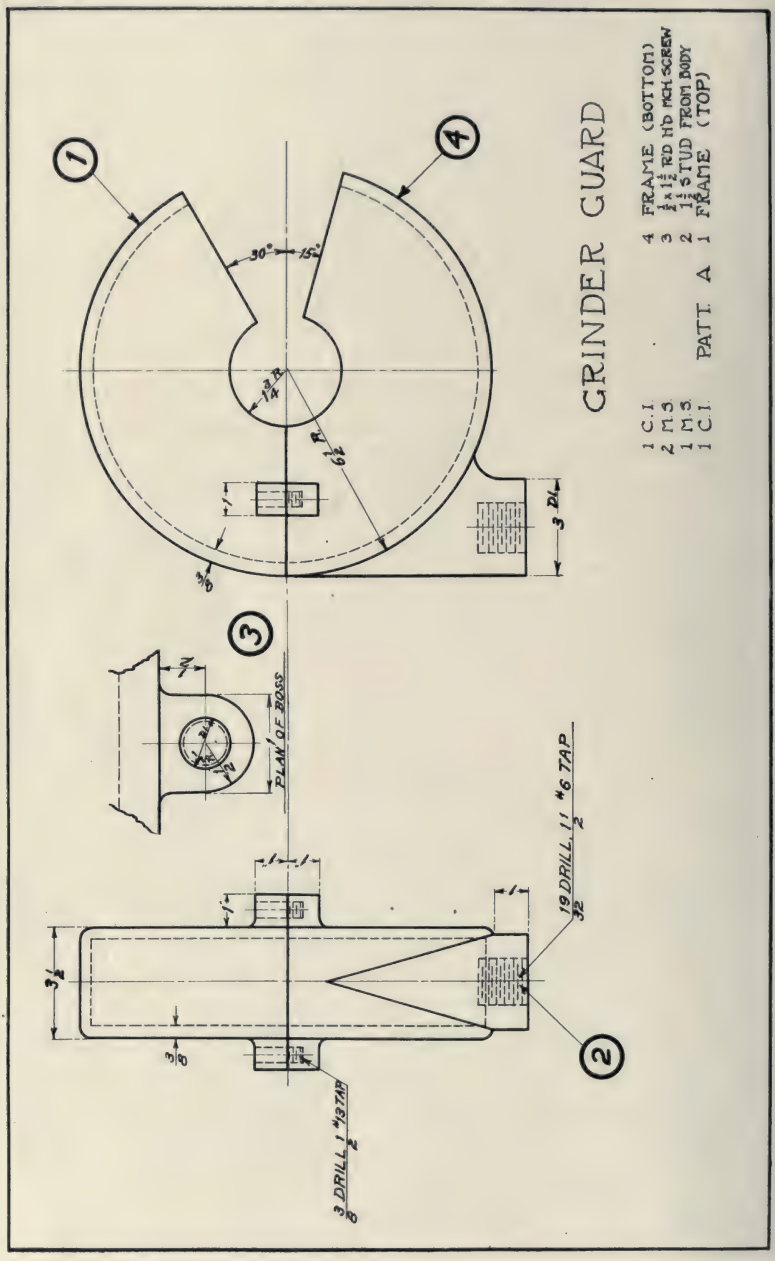
BENCH GRINDER.

This is a useful machine where small tool grinding and similar grinding operations are required. Its simple design offers a project in pattern-making and elementary machine shop practice suitable for school work.

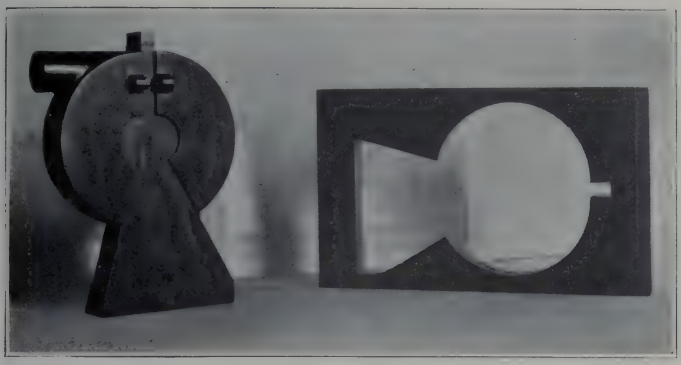
The base is made in the cored form. A split or parted pattern is required, and should be parted lengthwise through the bearings. Before beginning work on the pattern for the base, it is advisable to lay out carefully, full size, on a well seasoned board (use shrink rule) a longitudinal section through the center of the bearings. This layout will facilitate the mixing of both pattern and core-box.


BENCH GRINDER
DETAILS OF FRAME
16 HEX NUT 5/8 M S2
15 5/8 WASHER 1/8 x 1 1/4 M S2
14 SQ. HEAD SETSCREW 3/8 x 1 1/8 M S2
13 BUTTON HEAD BOLT M S2
12 H'DLESS SET SCREW 5/16 x 3/4 M S1
11 R.H. CAP SCREW 5/16 x 3/4 M S4
10 R.H. CAP SCREW 3/8 x 3/4 M S2
9 PULLEY C I1
8 FRONT FLANGE C I2
7 BACK FLANGE C I2
6 CAP C I1
5 SHAFT M S1
4 TOOL REST C I2
3 TOOL REST HOLDER C I2
2 BRACKET C I1
1 BASE C I1
SECTION C-D
SECTION A-B
SECTION E-F


BENCH GRINDER
DETAILS
FINISH ALL OVER
10 THDS PER IN
TAP-DRILL
FINISH ALL OVER
DRILL


GRINDER GUARD
1 C.I 4 FRAME (BOTTOM)
2 M.S 3 1/4 x 1 1/2 RD HD MCH SCREW
1 M.S 2 1 1/2 STUD FROM BODY
1 C.I PATT. A 1 FRAME (TOP)
30°
15°
R 19
3 1/4
3/8
PLAN OF BOSS
3/8
3 DRILL 1" #13 TAP
19 DRILL 1 1/2 #6 TAP

The shaft is made to carry two wheels; one of the threaded ends is made longer than the other to permit the use of a thick polishing or buffing wheel. The bearings are babbitted, and cap shimmed with a thin piece of cardboard to take up wear.



GRINDER GUARD PATTERN AND CORE-BOX.

GRINDER GUARD.

Many grinders, especially tool grinders, are sold without guards over the wheels. The accompanying guard was made for a Wiley wet-and-dry machine tool grinder. Although it is a special pattern designed and built by one of our students for this particular machine, it may easily be adopted to any grinding wheel by changing dimensions and method of attaching.

The pattern is made of white pine; the casting is in two parts 1 and 4 on the drawing, and bolted together over the wheel.

REVIEWS

The Schools and the Nation. By Dr. Georg Kerschensteiner, director of education in Munich. Translated by C. K. Ogden, of Cambridge, England, with introduction by Viscount Haldane. Published by Macmillan & Company, London. 5x7¼ in.; 351 pages.

It goes without saying that this book written by the distinguished statesman-educator, of Germany, will receive a warm welcome in America. Dr. Kerschensteiner's visit to the United States no less than his cordial treatment of Americans in Munich, has cemented a lasting bond of personal as well as professional sympathy. But, like all his other books, it will be welcomed especially because it reveals an insight into problems of education which this country is trying to solve.

The theme of the book is expressed by the author in his introduction when, in speaking of educational institutions, he says "There are two defects in particular which we must deplore: (a) the failure to render the present school system an effective instrument in the cause of civic education; (b) the almost complete absence of any adequate provision for the continued training of boys and girls between the ages of 14 and 18—for that part of the population which earns its daily bread thru the practical work of commerce, handwork, industry, or agriculture." As would be expected, considerable space in the book is given to the continuation school and its organization. He gives what he regards as the three great essentials in organizing such work. But to those who are familiar with the many accounts of the continuation schools of Munich, probably interest will center in Dr. Kerschensteiner's discussion of the elementary school of the future.

One cannot read this book without getting a clearer vision of certain fundamentals in education which apply in America as well as in Germany, and he will surely appreciate as never before the value of common productive work as a means in general as well as trade education.

In this time of war, with the accompanying hatred, it is pleasant to notice by whom the book was translated, and to read the felicitious introduction by Viscount Haldane. It is perhaps still more pleasant to read in the author's introduction, dated March, 1914: "Much more important for me is the thought that in so far as other great nations occupy themselves with the spiritual and intellectual elevation of their people, Germany too will reap the benefit of their efforts. The rivalry of two countries in the matter of education is far more welcome, far more profitable, and far more glorious than any competition in armaments."

Textbook of Advanced Machine Work. By Robert H. Smith, of the Massachusetts Institute of Technology. Published by the Industrial Education Book Company, Boston. 5x8 in.; 575 pages; 609 illustrations; price, $3.00, net.

Five years ago two books by Mr. Smith were published and a third one was promised. The two issued were *The Elements of Machine Work* and *The Principles of Machine Work.* The third book was to be called *Advanced Ma-*

chine Work. Now the material published in the first two books and that prepared for the third has been revised and rearranged and published in two books—*Principles of Machine Work* and *Advanced Machine Work.*

The first of these two describes the metals and materials used in machine construction, and names the tools and instruments, and gives schedules of operations in hand processes. It treats of laying out work; chipping, filing and scraping; hardening and tempering carbon and high-speed steels; pipe fitting; soldering and brazing; lacing belts, aligning shafting and installing machines; drills and drilling; taps and taping; speed lathes, hand tools and hand turning; pneumatic chipping and riveting; autogenous welding.

The second book, *Advanced Machine Work,* treats of engine lathe work; cutting tools; measuring; turning; fitting; threading; chucking; reaming; mandrels and arbors; curve turning and forming; inside calipers and inside micrometers; boring and inside threading; brass finishing; broaching; drilling jigs; boring; boring bars and boring machines; eccentric turning; knurling; cylindrical, internal, surface and cutter griding; planing; milling; spur, bevel, worm and spiral gear cutting; tool making; spiral milling, and plug-and-button method of locating holes of precision in jigs and fixtures.

These books are the result of a rich experience as a practical machinist and as a successful teacher. They are supplied with a great number of excellent line drawings for illustrations; the names of the several parts of the machines are placed on the illustrations. The "schedule of operations" may be regarded as giving standard methods of procedure, including proper speeds to run machines. The text is well written and comprehensive. These books represent a high type of textbook writing.

The Essentials of Agriculture. By Henry Jackson Waters. Ginn & Co., Boston. 5¼x7¾ in.; 591 pages; price, $1.25.

Although written as a text for high schools, this book is equally well adapted for use in normal schools, brief courses in colleges, and summer schools. The author treats farming as the fundamental industry, especially emphasizing the main crops, namely, livestock production, dairying, and the care and management of soils. The adaptations of the principal crops to the various regions of the whole United States is a valuable feature, and gives the book a wide appeal. At the close of each chapter are questions, exercises and references. The exercises provide field and laboratory experiments; the reference lists cover the standard books, farmers' bulletins and available documents of experiment stations. Nine brief and concise appendices include apple and corn score cards, score cards for various types of farm animals, a tabulation showing the quantity of seed to sow per acre, a list of a hundred farm weeds and the methods of eradication.

The author recognized that no one person could compass the whole field, and he has called to his help an expert in each branch of the subject, who is responsible in large part for the material in the field of his specialty. This material has been organized into a logical work on agricultural science and practice.

Mechanical Drawing and Practical Drafting. By Charles H. Sampson, Huntington School, Boston, published by Milton Bradley Co., Springfield, Mass., 1915. 7½x11 in.; 112 pages; price $1.50.

This book is intended for use in schools where a rather comprehensive course is taught. It covers the following subjects in their order given: Lettering, geometrical problems, orthographic projection, developments, intersections of solids, machine details, assembling drawings, isometric and perspective drawing, and cam and gear design. It contains all tables needed in the solution of the problems given.

Shop Sketching. By Joseph W. Wooley and Ray B. Meredith. Prepared in the Extension Division of the University of Wisconsin. Published by McGraw-Hill Book Company, New York. 6x9 inches; 102 pages; price $1.00, net.

As stated in the preface "this volume presents the instruction papers prepared and used by the University Extension Division as a course for apprentices and older shop men who need a knowledge of mechanical drawing." The idea behind the organization of subject-matter in this book is "that the instruction must give the man just what he is going to use in his every day work, and that this must be given in the most direct and efficient manner with the least expenditure of his time and money."

The first chapter deals with certain fundamentals of mechanical drawing given in a very simple, practical way. These are followed by a chapter on screws and screw fastenings, a good chapter on sections, and one on assembly and detail drawings. Gearing is treated briefly, also isometric drawing and free-hand drawing. The selection of subject-matter for this book is well suited to its purpose, and the drawings used in the illustrations represent a high standard of technic.

The Model T Ford Car. By Victor W. Page. The Norman W. Henley Publishing Company, New York. 5x7 in.; 300 pages; price $1.00.

As indicated by the title, this book is written especially for Ford drivers and owners. It is a complete and practical explanation of the operating principles of all parts of the Ford automobile, with full instructions on driving and maintenance. The chapter on repairing and overhauling is clearly illustrated and should be valuable to both owners and operators. The book contains over 100 specially made diagrams and half-tone illustrations.

RECEIVED

Preliminary Program of Second Pan-American Scientific Congress. To be held in Washington, D. C., Dec. 27, 1915, to Jan. 8, 1916. Issued by the Department of State, Washington, D. C.

Twenty-second Annual Report of the Western Drawing and Manual Training Association. Miss M. Emma Roberts, supervisor of drawing, Minneapolis, Minn., chairman of editorial board. 237 pages, illustrated, price 50 cents. Contains all the addresses given at the Chicago meeting, including the address by Professor Charles H. Judd on "What Mental Processes are Cultivated thru the Mechanical Arts."

MANUAL TRAINING AND VOCATIONAL EDUCATION

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FOREWORD

THREE things are emphasized in this number: (1) salesmanship courses and placement bureaus for girls and women, (2) practical school methods in teaching carpentry, woodwork design and machine drawing, and (3) current discussion of problems in vocational education.

The initial article by *Miss Cassie L. Paine,* gives the origin of the school of salesmanship idea. In an illuminating way the author traces the development of the salesmanship problem as it grew out of the new conditions incident to the coming of the department stores in our larger cities. The article by *Miss* Louise Odencrantz gives the results of an investigation of the various placement agencies, mostly philanthropic, in New York City, and points out some of the defects in the practices of such institutions. The need of a more effective organization for such work is emphasized.

The spirited discussion by *Professor Fred D. Crawshaw* points out the difference between shop and school methods of doing work, and to what degree this must remain so. This is followed by *George H. Klingelhoeffer's* account of the methods of teaching carpentry in the Berry school. In this he makes clear the relationship of carpentry to elementary joinery, cement construction and cabinet making in a school where there is the atmosphere of real work as well as culture. *J. Calvin Nicholson,* in his third article on introductory problems in machine drawing, gives a frank and clear discussion of certain phases of method that reveals a too uncommon insight into the practical pedagogy of the subject. In the sixth article *Supervisor William E. Roberts,* of Cleveland, discusses design in relation to construction in wood, and shows how unusual refinement of design has been stimulated among the teachers of his city. In doing so the article suggests an effective method of teaching woodwork design.

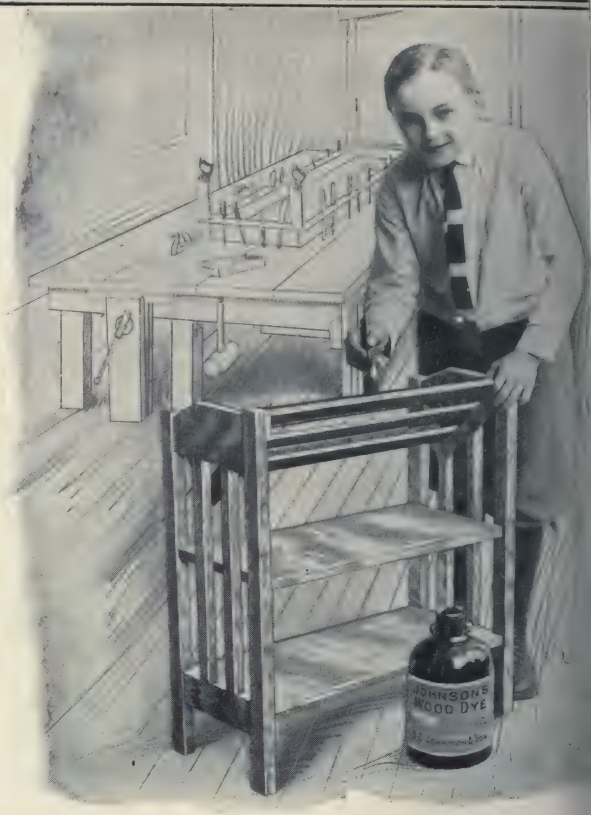
The department of Editorial Comment has began to overflow, as it were, and the overflow material is being utilized in short articles on important current topics. In this number *Mr. Dean* reports from the present "storm center" of educational discussion—New York City. He presents the fundamental points at issue between the Wirt and Ettinger schemes for reorganizing the elementary schools. *Dr. Bawden* presents a brief statement concerning the new two-year agreement between employers and employes in the cloak, suit and skirt industry of New York City, and refers to the school established by the National Cloak and Suit Company.

This Magazine is kept for sale at McClurg's in Chicago, and Brentano's in New York.

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FIELD NOTES

AN event of great importance in the educational history of Toronto, Canada, was the formal opening of the new Central Technical School last August. The building, which is centrally located, occupies two city squares, and is four stories high. Including the ground, furniture and equipment, the City of Toronto has invested about $2,000,000 in this great modern structure for technical training. It is said to be the best building of its kind in America. It provides day and evening courses for both boys and girls, which cover almost every branch of industry.

The U. S. Bureau of Education has begun the circulation of a series of "Vocational Education Letters" presenting certain questions that have arisen as to the intent, and probable effect, of the legislation which has been proposed looking toward the granting of federal aid for vocational education. Copies of the "Letters" will be sent to any address upon application to the Division of Industrial Education, U. S. Bureau of Education, Department of the Interior, Washington, D. C.

Massachusetts carried away more prizes in the first three classes of exhibits at the Panama-Pacific Exposition than any other state in the Union. The grand prize for the exhibit of a state-aided vocational system of education was awarded to Massachusetts; the state received a medal of honor for its agricultural vocational system, and also one for its industrial vocational system. The chief competitors of the Bay State were New York, Illinois, Pennsylvania and Ohio.

A comprehensive lecture course on vocations for women is to be given this year at New York University under the title "Woman's Work: Her Opportunity Today." The course includes twenty-seven lectures which later will be printed in pamphlet form for wider distribution. Each lecture will cover the points necessary for women to know concerning the vocation under discussion in order for them to reach intelligent conclusions. To this end Miss Eva E. vom Baur, who has charge of the course, has prepared a rough outline for the speakers to follow which will give a definition of the vocation, its inclusions and exclusions, the needed education and personal qualities, the actual openings and promises, advancements, compensations, obstacles, handicaps, and definite ways of securing a job. The cost, time and places of special training will be definitely stated, the kinds of people whith whom one comes in contact will be clearly pointed out, the exact facts as to the number of women employed at various works, and the attitude of men in the same work toward them.

The subjects discussed will include, women as an economic factor, the theory and practice of business, office work as a foundation for secretarial positions, business precepts and principles for the business woman, buying and selling, designing and manufacture of clothes, arts and crafts, architecture and interior decoration, journalism, advertising, legislation covering women's industries, foods, homemaking, woman and the community, agriculture, social service, institutional management, place for the nurse in the community, library work, medicine and law. Among the women who will speak are the following: Mrs. Charlotte Perkins Gilman, lecturer and writer; Miss Marie Little, head of the Woman's department of the Equitable Life Assurance Co.; Mrs. Lucinda Prince, of the Union School of Salesmanship, Boston; Mary Dreier, of the National Women's Trades Union League; Mrs. Henry Moskowitz, Dress and Waist Manufacturers' Association; Lady Duff Gordon; Mrs. Dorothy Dix; Miss Elizabeth Jordan; Mrs. Irene Osgood Andrews, American Association of Labor Legislation; Mrs. Christine Fredericks; Mrs. Havelock H. Lund, founder of the Forward-to-the-Land League; Dr. S. Josephine Baker, New York City Board of Health; Miss Lillian D. Wald; Mrs. Anna Martin Crocker, head examiner Municipal Civil Service; Miss Jessie Bonstelle, founder of the Municipal Theatre, Northampton; Miss Frances Cummings, Collegiate Bureau of Occupations; Miss Anne Edgerley, Publishers' Information Bureau. The lectures will be held every Tuesday evening in the Judson Memorial Hall.

(*Continued on p. VI.*)

FIELD NOTES—(*Continued from p. V.*)

The development of the cooperative industrial courses in York, Pennsylvania, during the past four years, has progressed quite beyond the expectation of the board of education. The work was introduced largely as an experiment, but the results have more than justified the effort. At first the trade of machinist was the only one open to students. Since then, pattern-making, cabinet making, plumbing, automobile building and repairing, molding and electrical work have been added to the course, and at present 11 local manufacturers are cooperating with the schools.

A conference was recently held in Philadelphia for the discussion of juvenile employment and the cooperation that should be established between the state employment agencies and the vocational guidance and compulsory education branches of the Philadelphia schools. The new State Employment Bureau was established in Harrisburg on October 1, and later branch agencies will be opened in Philadelphia and Pittsburg. When a boy or girl between the ages of 14 and 18 years applies for work at the Philadelphia agency, the tentative plan provides that the application shall be referred to the vocational branch of the public schools. After a physical examination, the school record of the applicant will then be investigated and he or she will be led into the line of work in which most progress can be made. The conference was attended by educators prominent in Philadelphia schools and in the State Department of Education, together with a representative on juvenile employment from the State Department of Labor and Industry.

A situation confronts the State Trade School in Bridgeport, Conn., which amounts to a real problem. The capacity of the school is only 280 students, but about 2,000 applications for enrollment have been made. Altho it is a state institution, the students are, for the most part, residents of Bridgeport, and if the board of education cooperates with the trade school by permitting the various public school buildings to be utilized for evening classes in blueprint reading, shop mathematics, mechanical drawing and machine design it will be possible to take care of about one-half of the complete enrollment.

The method of selecting who shall be admitted to the school is commendable. A card system is maintained giving all the necessary details concerning each applicant, and with this information as a basis the school officials select those who will be allowed to enter. A man who is desirous of perfecting himself at his trade is chosen in preference to one who knows little or nothing about the trade.

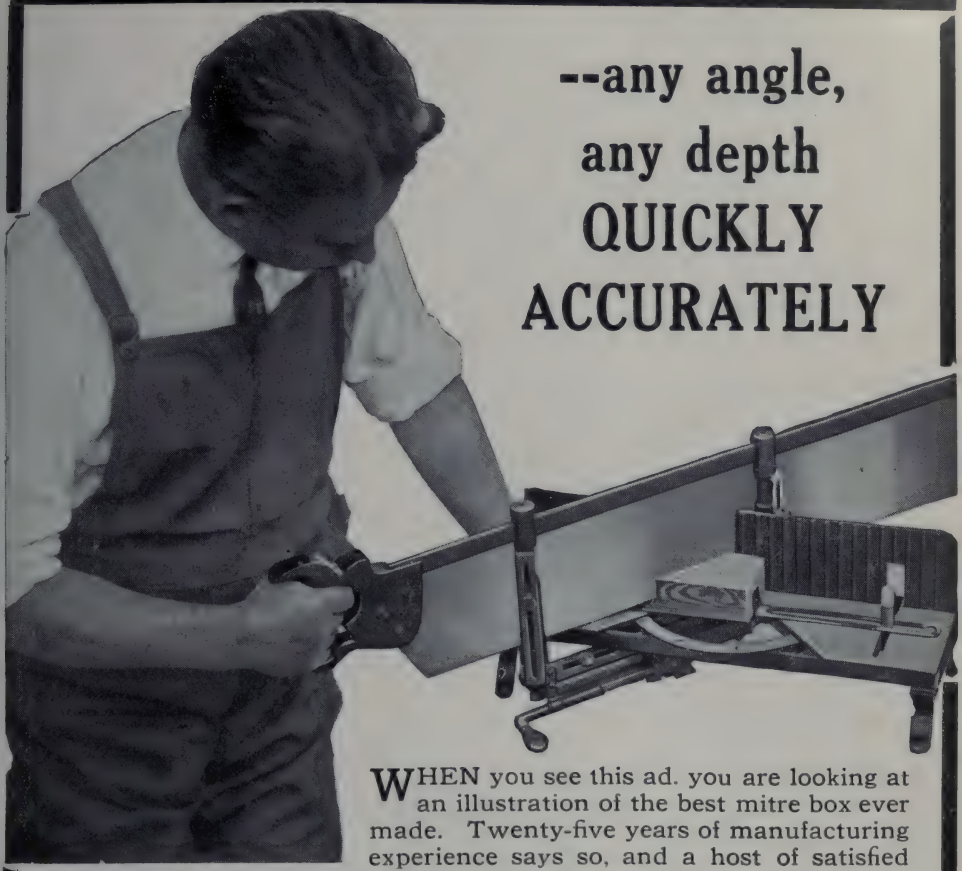
New York University is demonstrating in a very practical way the basic idea of the founders, namely, that a university should serve the people as simply and directly as possible. American merchants and manufacturers are facing the problem of an unprecedented development of foreign trade under rapidly and radically changing market conditions. Instead of raw materials in bulk, it is now proposed to sell finished manufactures abroad, an altogether different problem. Men who are fitted to act as pioneers of trade abroad are rare. To "make good" they must have a knowledge of foreign languages, commercial geography, foreign law, customs and business practices, shipping methods and selling systems and financing. New York University is taking a hand in fitting men for this important work.

For the first time since manual training shops were established in the public schools of Philadelphia, every boy in the 7th and 8th grades is enrolled in shop classes. This has been made possible by the equipping of two large new shops in the Howe school and the Northwest school.

With a record enrollment of over 110,000 in the Boston Schools, Superintendent B. F. Dyer has managed to provide for the 3,000 increase over last year on full time. The attendance at the continuation schools has also increased. On account of the European war, the fathers of many immigrant children have been called home to serve their country, and this has forced the older children to leave school and go to work.

A demand having arisen for instruction in freight traffic work in connection with the Mil-

(*Continued on p. VIII.*)



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waukee continuation school, an evening class has been organized with instructors thoroly versed in railroad traffic matters. The class is of interest to shipping clerks, bookkeepers and others having in charge the packing, describing and routing of shipments, and the auditing of bills.

The manual training classes in the high school at Hinsdale, N. H., have their shop quarters in the upper room of a garage building. This is another illustration of how some of our boards of education are pressed to provide the necessary facilities for meeting the demands of modern education.

The board of education at Camden, N. J., has taken the first steps toward the building of the $400,000 manual training high school that has been in contemplation for several years.

The new Cuyler Street School for Negroes in Savannah, Georgia, with its equipment, has cost about $80,000. There are three buildings, which occupy a block in the heart of the Negro quarter of the city. In addition to the usual grammar school studies, there are provided courses in cooking, serving meals, plain sewing, dressmaking, house cleaning and sanitation for the girls; and manual training, mechanical drawing and sanitation for the boys.

The Boys' Trade Building contains a manual training shop which has thirty benches fully equipped with tools for individual work. About one hundred boys are accommodated in this room at different times during the day. There is also a large room for mechanical drawing.

In addition to the regular course given to students, there is in contemplation a demonstration course for the benefit of cooks and house servants already engaged in regular work. It is proposed to give once a week, to each group of fifty, a course of about twenty demonstration lessons in the things most important for them to know. In this way it is hoped that the school may reach in a most practical and vital way a large number of servants now regularly employed in the homes of the city.

To those who think of vocational education as a recent development in modern education, it will be interesting to learn that the first school to give emphasis to practical courses has been in operation more than a century. The Farm and Trades School of Thompson's Island was first opened in March, 1814. Previous to 1833, it had various homes in the city of Boston, but in that year the Island was purchased and the school permanently established there. It is a philanthropic school conducted for boys who lack the means to secure such instruction elsewhere. From the first, agriculture has been the most important feature of the school. Other subjects have been added from time to time. Sloyd and meteorology are compulsory, but among the electives in the four-year course are printing, book-binding, blacksmithing, engineering, forestry, cabinet work, carpentry, cobbling, laundrying, baking, public hygiene, music and painting.

The portable school building has come to the rescue of boards of education pressed for manual training shops. At the Forest Park School, Springfield, Massachusetts, a portable building is used for shop classes in the morning and for classes in printing in the afternoon.

The success of the Boston Vocational Guidance and Placement Bureau has stimulated action in Worcester toward the organization of such a bureau. The recommendation, carrying with it an appropriation of $1,000 for the work of the first year, has been referred to the committee on finance.

Superintendent Homer P. Lewis has also recommended the establishment of a school of salesmanship for the benefit of clerks in stores. Mr. Lewis suggested that an effort be made to open this school in February. It was pointed out that the sessions should be held in the forenoons from 9 to 12 o'clock, and that specially trained teachers would be necessary to properly carry forward the work.

Edward Tingley has been appointed director of the vocational department in the State Normal School at Buffalo, N. Y., to succeed Harrison C.

(*Continued on p. X.*)



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Givens, who has resigned to take a position in the State Manual Training Normal School at Pittsburg, Kansas. Mr. Tingley goes from the position of director of manual training in the State Normal School at Shepherdstown, West Va., after spending the summer in special study at Teachers College, Columbia University, New York City. The work in the Buffalo school will include: supervision of the handwork in the practice school, grades 5 to 9; instruction in shopwork in the normal classes for men; evening classes for training journeymen mechanics to teach their trades; and supervision of the practice teaching of vocational department teachers who are teaching in the city schools.

The enlargment of the industrial course in the Hyde Park high school, Boston, has called for additions to the teaching force, and Martin L. Olsen, formerly pre-vocational machine shop instructor in the Quincy pre-vocational center, has been transferred to the Hyde Park high school to conduct courses in mechanical drawing and shop mathematics.

DeWitt Hunt, formerly teacher of manual training in the high school at Fort Worth, Texas, has been appointed head of the woodworking department of the Agricultural and Mechanical College, Stillwater, Oklahoma. The facilities of this department have been greatly increased by the addition of about $4,000 worth of new equipment, which includes five motor-head lathes, one 12 inch jointer, one universal saw table, one mortiser, one sander and one oilstone grinder.

Joe I. Davis, who was supervisor of manual training in Peru, Indiana, will assist Mr. Hunt.

Two new vocational courses of three years each in fine and applied arts, and manual arts have been announced by the College of Industrial Arts, Denton, Texas. The special purpose of these courses is to train teachers. Nineteen new members have been added to the faculty, which indicates that various departments have been strengthened.

In the Woodward and Hughes high schools in Cincinnati, a course for druggists' apprentices has been introduced. A complete course in printing will also be given in connection with the manual training courses. For the girls between 14 and 16 a special course in the sewing trades will be given, as far as possible, under trade conditions.

In their annual report the education committee of the Chamber of Commerce, Fall River, Massachusetts, gave a very comprehensive report on the subject of industrial education in Fall River. The committee recommended a school and industrial survey of the city, and urged the extension of continuation schools. In their recommendations they did not overlook the needs of the immigrant. Fall River must necessarily depend upon immigrant labor. Only about 13 per cent of the immigrants who come to this country and enter the industries can be classed as skilled workers, and manufacturers are constantly suffering an economic loss which would be corrected if these people were trained to become skilled workers.

The first step in this direction would be to teach them the English language, thus enabling them to understand and execute orders more efficiently and at the same time take advantage of more technical instruction. Appreciating the community value of an educational program for the immigrant, as well as its worth to industry, the committee strongly urged that provision to this end be made.

The State Department of Education of the University of New York has arranged for a series of drawing conferences with teachers thruout the State for informal discussion on general or special phases of the work. Four conferences have already been held. The dates and places for the remaining conferences are as follows: Malone, November 6; Kingston, November 13; Yonkers, January 15; Saratoga Springs, January 29; Rochester, February 19; Syracuse, February 26; Binghamton, March 11; Hornell, March 18; Dexter, March 25; Mineola, spring of 1916; Buffalo, April 22.

(*Continued on p. XII.*)



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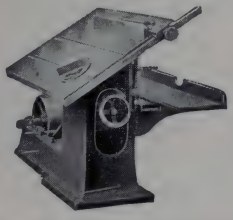
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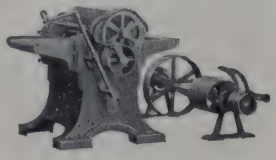


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FIELD NOTES

(*Continued from p. X.*)

In the vocational school at Lowell, Massachusetts, a course in factory management has been substituted for the course in house wiring. At the opening of school, students were registered from Lowell, Littleton, Acton, Chelmsford, Westford, Woburn, Wilmington, Dracut, Billerica, Tewksbury and Dunstable.

During the past summer vacation Thomas G. Russell, supervisor of manual training in Dunkirk, New York, had a class of 80 boys that came in four sections of 20 boys each for eight weeks. Three of the boys built fourteen bookcases for the schools and were paid $191 for them. At the present time these boys in the vocational classes are laying a floor in the basement of the high school and building the necessary work benches.

The first high school in the State of Maine to introduce pattern-making is the one at Bangor. The boys will make patterns which will be sent to the foundry where castings will be made for use in the machine shop next year. Benjamin C. Kent has charge of the work, assisted by W. L. Work.

In addressing the City Club of Los Angeles last summer, Meyer Bloomfield urged the business men to form an organization for studying the vocational problems of the city. He pointed out that the progressive business organizations of today are beginning to recognize that standards and ideals are as necessary in the purchase of human service as in the buying of merchandise. He pointed to the fact that San Fransico is preparing to make a vocational survey, and the board of education, working with the National Department of Education, will spend $800 to find what the children of San Francisco need that is not provided by the present school system. He stated that Minneapolis is spending $15,000 for a like purpose.

The Dayton Cooperative High School is the name by which the Stivers High School is best known to many of the students in Dayton, Ohio. In operation it follows quite closely the "Fitch-

(*Continued on p. XIV.*)



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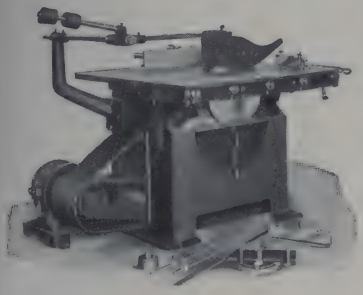
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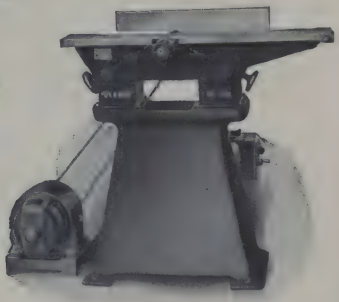
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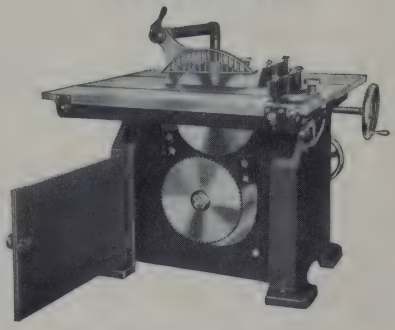
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A booklet on how to sharpen and properly set Saws of all kinds. There is one *right* way to do this. Why not know how by reading this booklet. Write for FREE BOOKLET containing information valuable to all students.



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THE BOYS



This machine affords complete protection employing guards of practical design over all moving parts. This is but one phase of the completeness of this universal saw bench. Get our bulletin and prices before you buy.

THE TANNEWITZ WORKS
GRAND RAPIDS, MICH.

SIMPLIFIED MECHANICAL PERSPECTIVE

By FRANK FORREST FREDERICK
Director of School of Industrial Art
Trenton, New Jersey.

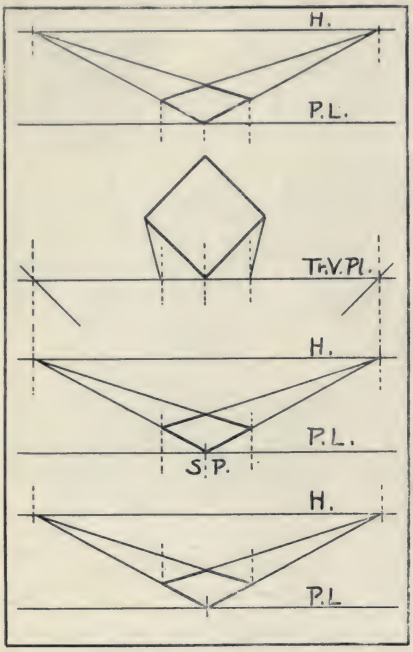


Fig. 12.

A simple, direct, and practical textbook on perspective. It presents a course of study consisting of 37 problems which have been evolved thru an experience of twenty years in teaching the subject. The problems are simple and aim to teach "the perspective sense" as well as the drawing of lines. The illustrations are well made and easily understood. It is an excellent text for beginners and is planned for students of high school age who have already received some elementary training in mechanical drawing.

POSTPAID 75 CENTS.
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Catalogs 10, 12, 14 and 15
Two pages of designs in No. 15

The Thos. K. Lewis Co.
204 E. Tompkins St.
Columbus - Ohio

FIELD NOTES

(*Continued from p. XII.*)

burg Plan," except that it goes still further by providing for the boy who desires to enter one of the engineering professions. Boys may enter the University of Cincinnati as cooperative students, working two weeks and going to school two weeks for five years. At the end of this time they will be given a degree in engineering if proficient in their work. During the past year eight Dayton firms cooperated in this work.

The first evening high school in Fresno, California, was opened this fall, with instruction in machine shop, automobile repairing, mechanical drawing, vocational English and domestic science, including dress-making and cooking. The regular course in the high school has been changed to cover six years instead of four, and the junior college work which has been in progress for several years will be technically included in the high school. Pupils may receive diplomas from either the four or six-year course. As heretofore, completion of the six year's work will entitle a pupil to enter the junior year in any accredited college.

The Young Men's Christian Association at Jacksonville, Florida, has employed William Richie, a graduate of the Eastern Kentucky Normal School, to direct the work of their manual training department. The equipment includes 16 benches, each equipped with a vise and a set of tools. For general use there is a motor-driven turning lathe and a scroll saw, also an assortment of turning chisels, gouges, pliers, carving tools, nippers, letter punches and screwdrivers. It is one of the most complete equipments in the state for teaching carpentry, and is the gift of A. G. Cummer, of Jacksonville.

A unique school is the National Farm School, located in St. Louis County, Missouri. The school was opened in March, 1914, for the purpose of providing a vocational school for children who have never finished the grammar school, but would be benefitted by out-of-door training. The institution is supported by contributions of friends who purchase an acre or more of property and deed it over to the school.

(*Continued on p. XVIII.*)

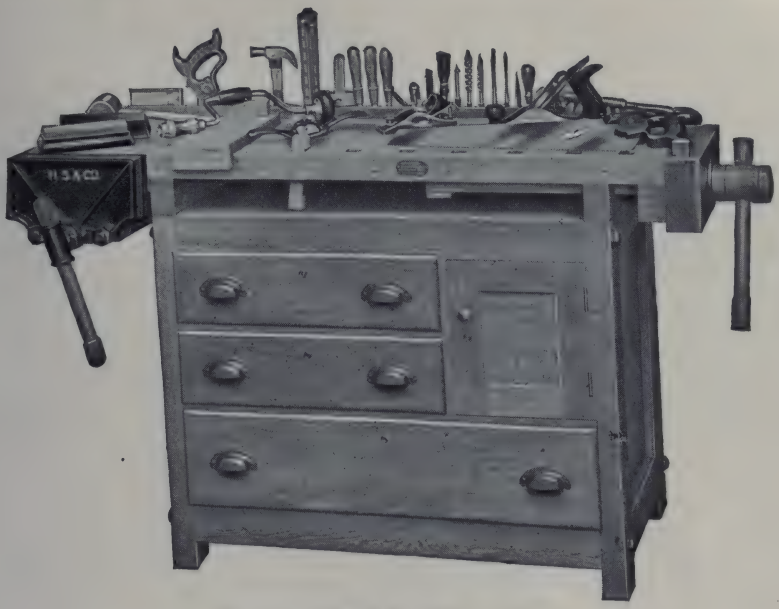


Illustration of our New No. 25A Outfit

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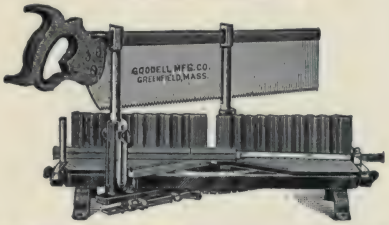
To directors and instructors and all those who are interested in Manual Training we will send our Tool Circular No. 35.

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VENEERS, 1-30 in. to 1-4 in.
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for DOMESTIC SCIENCE
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BENCHES
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"WE ALSO SUPPLY RAFFIA"

FIELD NOTES

(*Continued from p. XIV.*)

By this method the recently-purchased farm of 200 acres will soon be paid for.

At an expense of about $8,000 the basement of the high school at Atlantic, Iowa, has been fitted up for the manual training, domestic science, and gymnasium work of the public schools. Out of an enrollment of approximately 1163 pupils in the public schools, 225 boys are enrolled in the manual training department and 200 girls in the domestic science.

Willard Keir, formerly of Eldora, Iowa, has charge of the manual training at St. Petersburg, Florida. The work has been established there for about 12 years, making it one of the oldest points in the state where manual training is taught. Mt. Keir has a kerosene engine to drive the machines, which seems almost a curiosity to one accustomed to electrically-driven machinery.

At a recent meeting the board of education of Maquoketa, Iowa, ordered a variety saw and two woodworking lathes for their new $25,000 manual arts building. Courses in perspective, normal training and lathe work have been added this year. F. D. Thompson is supervisor of manual training.

Frederick E. Benson, the first graduate of the three-year vocational metalworking course for teachers at Bradley Institute, is now teaching in the high school of Akron, Ohio.

(*Continued on p. XX.*)

"AT YOUR SERVICE"

Two Excellent Books of Blueprints

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For Beginners: "Benchwork for the Grades." Book One.
For Advanced Students—ready for cabinet work, "Graded Projects for Advanced Woodwork."

I supply you with Manual Training Woods, Benches, Tools and sundry items. Also—Cooking Tables, Domestic Science Utensils, Etc.

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A
GOOD CHAIR
WITH A
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IS A
COMBINATION
HARD TO BEAT



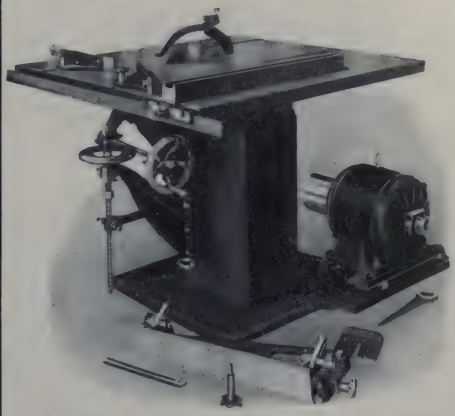
The good chair can be made in your manual training department, but the good cushion on account of the difficulty in getting proper materials, must be purchased elsewhere. The "Grand Rapids Cushion Co." is fully equipped to handle this class of work having furnished cushions for Manual Training Schools in all parts of the United States. For full information write

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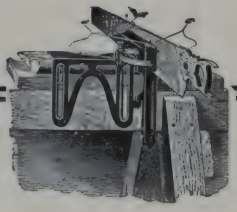


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MY catalog No. 22 is all ready for the call now.
¶It is just fresh off the press and is brimming over (from page one to page fifty-six) with tables and benches attractive to the student, at prices attractive to the board.
¶It is bound like a book, and will stand the wear and tear necessary for filling big orders and little ones.
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MITRE BOX

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For manual training schools it has no equal. Its simplicity and accuracy appeals to both teacher and pupil.

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This is the record of those who have taken the course represented by

Mechanical Drawing
AND
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BY CHARLES H. SAMPSON
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A fact which stands as an unprecedented testmonial to the practical value of the course of study given by this book which is exactly the same as used by Mr. Sampson in teaching these successful pupils, and is perfectly adapted to all institutions of high school or college grade. Its simplicity, completeness and effectiveness will appeal to every teacher of this subject.

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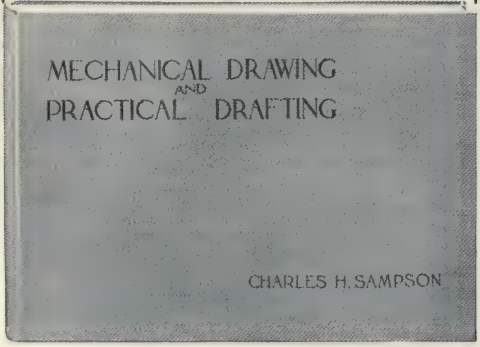
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Send for descriptive circular.

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Springfield, Mass.
BOSTON NEW YORK PHILADELPHIA
ATLANTA SAN FRANCISCO
Chicago; Thomas Charles Co. Kansas City; Hoover Bros.



FIELD NOTES

(*Continued from p. XVIII.*)

The board of education at Beach, North Dakota, have elected B. M. Hansen to take charge of the manual arts department of their city schools. Mr. Hansen goes from a similar position at Mayville, Wis.

Frank L. Hann, supervisor of manual training at Davenport, Iowa, reports that a new manual training building is to be erected and equipped in that city.

Willard L. Mathews, formerly supervisor at Lancaster, Wisconsin, succeeds J. Scott Wiseman, as supervisor at Kewanee, Illinois. Mr. Wiseman goes to Great Falls, Montana.

L. F. Neeb, of Cincinnati, Ohio, succeeds H. M. McCully as teacher of manual training in McKeesport, Pa.

Last summer Valparaiso University added a unique feature to its course in forging. The class was taught by one of the Gary shop teachers, and each Saturday the class was taken to Gary to work in the Gary vocational shops.

Stanley A. Zweible, supervisor of the cooperative industrial courses in York, Pennsylvania, has been appointed a member of the State Board of Industrial Education.

In an enrollment of 418 in the Worcester Trade School, 121 were enrolled for machine shop. John P. Casey has charge of the department, and he has received enough orders to keep the students busy all this year.

A noticeable feature of the public school exhibits at the state and county fairs this year has been the work of the manual training and domestic art and science departments. This special emphasis upon the practical results of educational endeavor encourages further extension of the work in places where its value has not been fully appreciated. At the state fair in Minnesota, the handwork of the wards of the State were featured.

TRADE NOTES

It is always gratifying to us when an advertiser reports an increase in his business, and it is especially so when he gives this magazine a goodly share of the credit for his success. The Beehive Press, Peoria, Illinois, report that their sales of the Nala rule thus far in the school year are double what they were for the same period last year. In one city in the Mississippi Valley, where this rule was specified, they sold 4,300 rules. The Nala rule is especially adapted for use in connection with elementary construction work, and every teacher and supervisor of the lower-grade work would do well to become acquainted with its merits.

The complete catalog of the Kewaunee Mfg. Co., Kewaunee, Wisconsin, covers equipment for the physics, chemistry, biology, domestic science, manual training, kindergarten and agricultural departments. It is noteworthy that the manufacture of school equipment has never been a side issue with this firm; from the very beginning they made it "the one thing I do." They have studied the developing needs in these various lines of equipment and have endeavored to meet them at every point.



In the filing and re-filing of a saw it is difficult to keep the teeth of an even height, tho that is a positive requirement for straight and true cutting. Where the teeth are uneven it is necessary to dress them down until all are of an even height, and this should be done before any attempt is made to re-set or re-sharpen. To do this "dressing" easily and properly Henry Disston & Sons of Philadelphia make a hand-saw jointer shown in the above cut.

If there is a craft worker or a manual training teacher who has not in his possession a copy of the catalog and supplements issued by The Thos.

(*Continued on p. XXII.*)

Just Off the Press

YOUR NEW TEXTBOOK

Practical Forging
AND
Art Smithing

By Thomas F. Googerty



A PRACTICAL textbook by a master craftsman in wrought metal. Presents a course of 20 exercises in hand-forging and 12 exercises in hand-smithing, accompanied by information regarding tools, processes and materials. It is well illustrated with line drawings and photographs and numerous beautiful examples of completed work. The text is clear, simple and easily understood.

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The Bruce Publishing Company
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Milwaukee, - - Wisconsin



TRADE NOTES

(*Continued from p. XXI.*)

K. Lewis Co., 204 Tompkins Street, Columbus, Ohio, he would do well to have one for ready reference. The supplies and tools for leather work, all forms of metalwork, including jewelry, also woodcarving, chair caning, cabinet furnishings, together with sheet brass and copper and other miscellaneous supplies are covered. This firm also sells the Hoffman attachable drawing table bracket. This bracket is a drawing table support which is firmly attached with a double clamp and can be adjusted to any height or angle. It will support a drawing board 30 inches square, and allows the board to be revolved.

The competition offer which J. D. Wallace, 527 W. Van Buren Street, Chicago, makes in this issue is quite unique. It affords an opportunity for three students to earn a cash prize of $25.00 each, and the school of one of the students to receive a Wallace bench planer, belt driven type, fitted with the flap and shutter guard. Complete details will be sent to those interested.

A recent catalog from Alexander Dodds Company, Grand Rapids, Michigan, illustrates and describes their complete line of tilting and stationary saw tables, their oscillating mortising machine, and their new motor and belt driven swing cut-off saw. In their swing cut-off saw, the column is sustained by bearings in hanger boxes, entirely independent of the revolving parts. The countershaft revolves in its bearings without having to sustain any weight but its pulleys. This firm has established a well-earned reputation as manufacturers of high-grade, moderate priced saw tables.

In the course of a few months some of the students in advanced manual training work will be wanting to know of their instructors where they can purchase cushions for their chairs when completed. The Grand Rapids Cushion Co., Grand Rapids, Michigan, have been cultivating this trade for several years, and will be glad to get in touch with teachers at an early date in order that the varying requirements may receive the best attention possible.

(*Continued on p. XXIII.*)

TRADE NOTES

(*Continued from p. XXII.*)

The purchase of high-grade lumber in small quantities has been more or less difficult owing to the fact that the business was deemed undesirable by dealers. We are therefore very glad to learn that the Evansville Veneer Company, Evansville, Indiana, are prepared to take care of this demand. They can furnish the various kinds of fine lumber, including mahogany, walnut gum, quartered and plain oak, poplar, pine and cypress, in ¼inch to 3 inch; they can also furnish the different veneers in from 1/30 in. to 1/4 inch.

Two attractive and practical hand drills are just being put upon the market by Millers Falls Co., Millers Falls, Massachusetts. One special feature is a chuck of new design that is compact and accurate in centering drills. It has three jaws, each in its separate solid socket, opened by springs that are concealed and will not get out of order. The capacity is for round shanks from 0 to $\frac{3}{8}$ inches in diameter. Another feature is the main handle which is of convenient shape and made from birch stained deep mahogany. It has a screw cap and hollow receptacle containing eight wood boring points. Gears are cut, small ones being of steel. Drill No. 104, has malleable iron frame and one small gear, while No. 304 has solid steel frame with both working and idler small gears.

The Russell Jennings Mfg. Co., Chester, Connecticut, has issued a circular describing their "Fibre Handle" screwdrivers for machinists, cabinet makers, and electricians. These screwdrivers are said to be practically indestructible. The blade is forged from tool steel properly hardened and tempered, and extends thru the handle.



Powerful, Compact, Convenient

This "Yankee" Push Brace No. 75 can be used in tight corners and places where the bit-brace is a clumsy tool.

No. 75 has famous "Yankee" Spiral Ratchet drive, all you do is "push." Quick on boring—holds all usual wood drills and bits with square shanks up to ½ inch. Speedier than any other tool for light drilling in metal, for driving or drawing heavy screws, or running-up nuts on bolts. On automobile or light machinery repair work, and about the garage it is a tool of big usefulness.

"YANKEE" Push Brace

No. 75. Price $2.80

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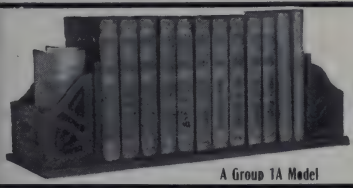
BOXWOOD RULES No. 702 (Old No. 18) No. 761 (Old No. 63) No. 808 (Old No. 5) and No. 881 (Old No. 54)

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Kindergarten, Manual Training and Vocational goods of all kinds. Also Bradley's Water Color Paints, the best in the world.

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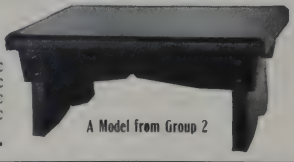


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A Model from Group 2



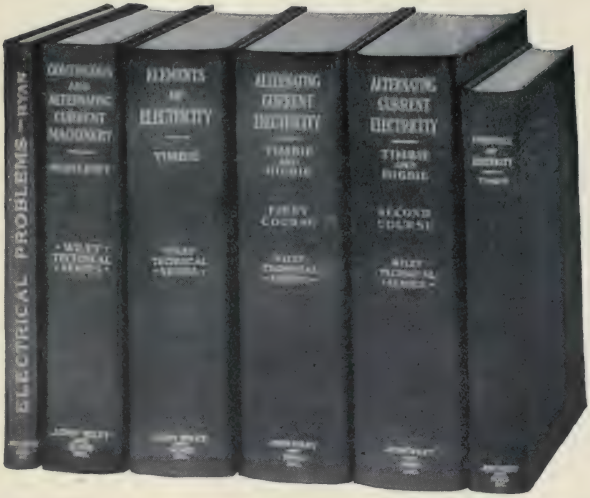
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BOOK NOTES

HOUGHTON Mifflin and Company, of Boston, has announced a new book by Professor Frank M. Leavitt, of the University of Chicago, which is most timely. Its title is *Prevocational Education.* The book is based on actual results, and will, therefore, be the first authoritative book on this new phase of school work. Another book announced by the same publisher is *Youth, School and Vocation,* by Meyer Bloomfield, director of the Vocation Bureau of Boston.

The Minnesotan is the title of a new magazine published monthly by the Minnesota State Art Commission, St. Paul, in the interests of art development in the state. Maurice I. Flagg is the editor. One way that art is being promoted in Minnesota is by furnishing good designs of village and farm buildings to home builders.

A notable book in the field of general education has recently been issued by E. P. Dutton and Company, of New York. This is *Schools of To-Morrow,* by John Dewey and Evelyn Dewey. A hasty turning of the pages would seem to suggest that this book may be regarded as a sequal to *The School and Society;* it deals with the same elements after fifteen years have elapsed. We look forward to reading it and to rereading *The School and Society* along with it.

The Bruce Publishing Company, of Milwaukee, has just issued a book on forging by the one man who has done most for art forging in the schools of this country—Thomas F. Googerty. The title of the book is *Practical Forging and Art Smithing.* It is a series of problems constituting a course of instruction, with notes on the problems.

Problems in Wood-Turning, by Crawshaw, is now published in a sewed binding at the same price as the former loose-leaf binding. This is the only book on wood-turning satisfactorily applying the principles of form and proportion to objects turned in wood.

Popular Mechanics Magazine has just issued its second volume of *The Boy Mechanic.* This is made up of extracts from their magazine which are especially interesting to boys. It contains a thousand things for boys to do—things to build or experiment with. These are in the fields of electricity, mechanics, sports, metalwork, photography, magic, etc.

Shop Problems, the collection of tracings ready for blue-printing, by Siepert, has been welcomed by manual training teachers generally. Professor Siepert has already begun to plan a similar collection for next year.

The sale of *Workshop Note-Book—Woodworking,* by George G. Greene, has been remarkable. Four editions have been exhausted since its publication in November of last year, and the press is now running on the fifth edition. It has been adopted in both large and small cities. It is especially adapted to students beginning woodwork.

A READING CIRCLE BOOK.

Manual Arts for Vocational Ends, by Crawshaw, appears on this year's list of books for the reading circle for teachers in the state of Oregon. A pamphlet announcing the course recently published by the State Department of Education of Oregon contains the following description of the book:

"The author is professor of Manual Arts in the University of Wisconsin. The book contains 100 pages of carefully organized material that is of inestimable value to those who are interested in any phase of industrial education and is of exceptional worth to all who are interested in general education. The topics considered are a general discussion of the relation between manual training and industrial education; possibilities and opportunities in the organization of the manual arts; organization and teaching of the manual arts in the primary grades, in the grammar grades, in the high school; the teacher and supervisor of the manual arts."

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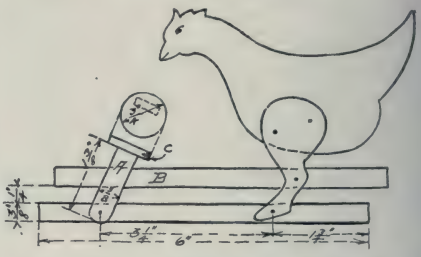
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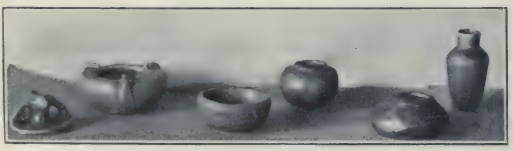
A manual treating of the tools, materials and equipment required for carrying on the work in the fourth grade. A course of study is outlined and detailed drawings of unusual interest are shown. It is illustrated with photographs showing students at work in the ordinary school room. The subject is developed in the spirit of modern pedagogy, it has the play spirit—the child's point of view in his work. The course presented is in successful use in the public schools of Seattle, Wash.

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CLAY WORK

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A TEACHER'S HANDBOOK

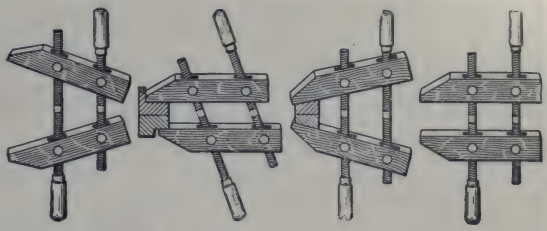
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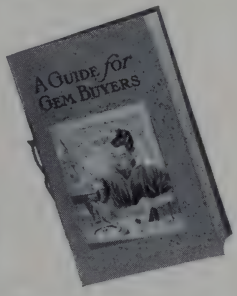
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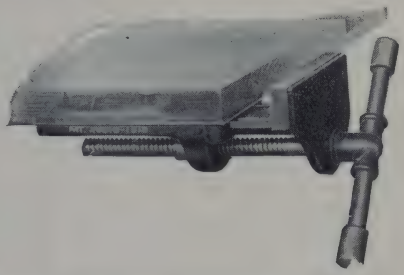
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AFTER HOURS

HONOR TO WILLIAM HAWLEY SMITH.

A few days ago we had a big civic and industrial parade in Peoria. Merchants, manufacturers, gardners, civic organizations and the schools took part. Among the floats (and many of them were indeed works of art) none seemed to make a stronger impression than the one representing the public schools as the "Melting Pot of the Nation." The accompanying photograph shows how the idea was represented. But one of the finest things about it was the recognition of the great work for education which has been done by our distinguished citizen, William Hawley Smith, by working into the label the title of his book *All the Children of All the People.* With the fine touch of sentiment expressed in using this title, it is no wonder that the float won the first prize for being the most unique in the parade.



A REMINDER.

THE other day I received a letter from H. Williams Smith, of London, and along one edge was a label marked in big letters "Opened by Censor, 673." I said to myself "At last the war has come in between me and my friend across the ocean. I wonder whether this mysterious inquisitor No. 673 enjoyed the letter and the newspaper clippings as much as I did. If he didn't I am sorry for him; I am always sorry for anyone who is forced to read letters or theme papers that do not personally interest him. I wonder whether the same inquisitor will read my reply. If he does, I hope he will not report its contents to the American Ambassador in London.

Appropo of the letter, I wonder how many of the readers of this column would like to show their patriotism after each day's work in teaching by serving as night policeman in his town or city. Here is a sentence from Mr. Smith's letter:

"And now I have to go on night duty as a special constable from 10 p. m. to 2 a. m.; a fitting and convenient time for meditation."

But the inconveniences of doing police duty, is nothing in comparison with the loss of friends, and even the loss of friends is not always to be compared with the anguish of spirit that accompanies war.

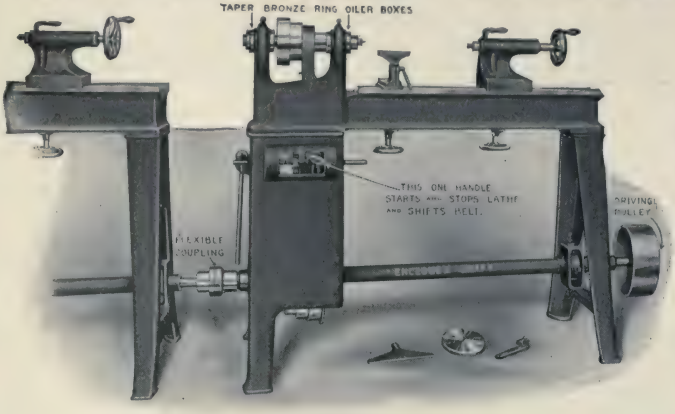
ON OVER-RATING ONE'S OWN ABILITY.

I have seen a few people whose appreciation of fine craftsmanship seemed to be limited to the work of their own hands. Now that is an excellent basis for appreciation, but it is not the whole structure. The superstructure must have wrought into it other valuable materials, one of which is a knowledge of what other workers in the same craft have done. The danger of overestimating one's own work is likely to be past when one becomes acquainted with the masterpieces of former generations and the work of recognized experts of today. One reason why the young writer studies literature is to help him to properly evaluate his own writings.

The other day I was reading one of those famous presidential discourses of Sir Joshua Reynolds before the Royal Academy of England. In the second address, delivered in London on the 11th day of December, 1769, is the following paragraph which caught my attention:

"A student unacquainted with the attempts of former adventurers, is always apt to over-rate his own abilities; to mistake the most trifling excursions for discoveries of moment, and every coast new to him, for a new-found country. If by chance he passes beyond his usual limits he congratulates his own arrival at those regions which they who have been steered a better course have long left behind them."

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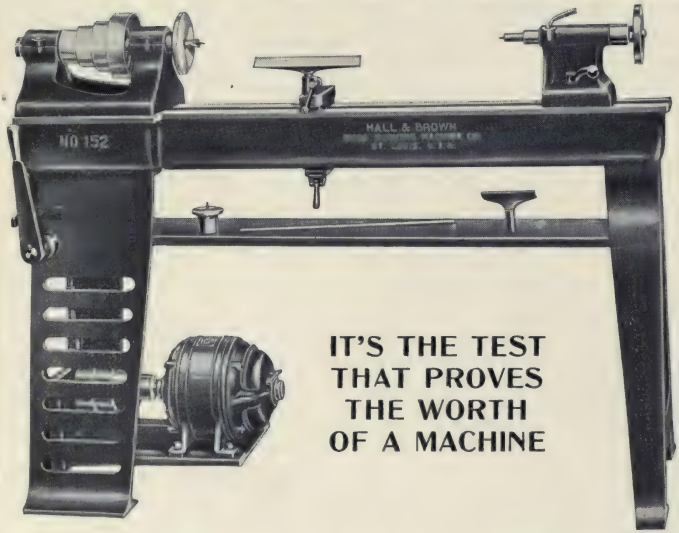
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VOLUME XVII NUMBER 4

MANUAL TRAINING AND VOCATIONAL EDUCATION

DECEMBER, 1915.

TO FIT MILLIONS FOR THEIR WORK:

The Smith-Hughes Bill, A National Preparedness Plan to Equip This Country for Holding Industrial and Commercial Supremacy in the Future.

Alvin E. Dodd.

WHAT is perhaps the most important movement in the development of education in the United States will come before Congress this winter when that body takes up the recommendations of the President's Commission on National Aid to Vocational Education.

The Smith-Hughes Bill embodying these recommendations and so named from its sponsors in the Senate and House—Senator Hoke Smith and Representative Dudley M. Hughes, both of Georgia—bids fair to attract more than usual attention. For years the subject has been discussed in and out of Congress but the efforts to enact a law have been defeated, altho the Page Bill which passed the Senate in 1912 but failed in the House, had the same general purposes in mind.

Summarized, the bill extends to the states the help of the government in establishing vocational education and in training persons to teach it. This is to be done by grants of money, and by the establishment of a Federal Board for Vocational Education to work with and thru the states in starting this form of education. The purpose of the proposed law is not to enable the Federal Government to enter the educational field and establish schools, but rather to extend such aid as will stimulate the various states to develop the work themselves.

The Federal Grants are to be made for instruction in agriculture, the trades and industries, and for the training of teachers of agriculture, trade, industrial, and home economics subjects as follows:

Year	Toward salaries for agricultural teachers	Toward salaries for trade and industrial teachers	For training of teachers for vocational work	Federal Board of Vocational Education for administration, investigation, studies, etc.	Total for each year
1915—16	$ 500,000	$ 500,000	$ 500,000	$200,000	$1,700,000
1916—17	750,000	750,000	700,000	200,000	2,400,000
1917—18	1,000,000	1,000,000	900,000	200,000	3,100,000
1918—19	1,250,000	1,250,000	1,000,000	300,000	3,700,000
1919—20	1,500,000	1,500,000	1,000,000	200,000	4,200,000
1920—21	1,750,000	1,750,000	1,000,000	200,000	4,700,000
1921—22	2,000,000	2,000,000	1,000,000	200,000	5,200,000
1922—23	2,500,000	2,500,000	1,000,000	200,000	6,200,000
1923—24	3,000,000	3,000,000	1,000,000	200,000	7,200,000

The maximum in each case above is continued annually after 1923-1924. For agricultural teaching the money is to be allotted the states in the proportion that the rural population of each state bears to the rural population of the United States. In the same way the allotments for trade and industrial teaching will be in the proportion which the urban population of each state bears to the total urban population of the United States; while for training teachers in agriculture, the grants are to be allotted to the states in the proportion which their total population bears to the total population of the United States.

In the interests of the smaller states it is provided that of the two funds for salaries of teachers no state shall receive less than $5,000 annually prior to 1922, nor less than $10,000 annually thereafter, and that of the fund for training teachers no state shall receive less than $5,000 annually prior to 1918, nor less than $10,000 annually thereafter.

For example, the states of New York, New Jersey, Connecticut, Pennsylvania, and Massachusetts which may be said to form the metropolitan section of the nation, will receive:

FOR THE SALARIES OF TEACHERS, SUPERVISORS OR DIRECTORS OF AGRICULTURAL SUBJECTS:

	1915-16	Maximum. 1923-24
New York	$19,550	$117,330
New Jersey	6,400	38,400
Connecticut	1,150	6,900
Pennsylvania	30,750	184,500

FOR THE SALARIES OF TEACHERS OF TRADE AND INDUSTRIAL SUBJECTS:

	1915-16	Maximum 1923-24
New York	$84,300	$505,800
New Jersey	22,350	134,100
Connecticut	11,750	70,500
Pennsylvania	54,300	325,805

The receiving of these funds is contingent upon the states meeting certain "conditions of efficiency." For most part these are left to be determined by agreement between the Federal Board and State Board, altho some are fixed.

It is clear from the "conditions" laid down, that the Commission which prepared the bill had no intention of presenting a pork barrel measure. Some of the stipulations are:

I. For each dollar received from the government, the state shall expend an equal amount for the same purpose, besides meeting all costs of plant, equipment, and maintenance.

II. "The controlling purpose of all such education" must be to "fit for useful employment." It must be of less than college grade, and designed to meet the needs of persons over 14 years of age who have entered upon trade, industrial, farming, or home-making pursuits.

III. The schools aided in part by the National Government must be supported and controlled by the public.

IV. Before money for training teachers can be received, each state must show that such training will be given only to persons who have had adequate vocational experience in the line of work which they are preparing to teach.

V. To administer these funds in the states, each legislature is required to designate or create a state board of not fewer than three members. The existing state board of education may be so designated. Thus each state will have its own board and study its local needs, being free to develop its own plans and always taking the initiative in the movement.

A FEDERAL BOARD TO COOPERATE

To administer the act for the United States the bill creates a permanent Federal Board for Vocational Education, to consist of the postmaster general, the secretary of the interior, the secretary of agriculture, the secretary of commerce, and the secretary of labor. The commissioner of education is to be its executive officer.

Considerable opposition seems likely to appear to a board of control made up of cabinet officers. A board representative of employers, employes, and educators who can give more time and who are in closer touch with the subject will undoubtedly be demanded when the matter goes before the Congressional committees.

Cooperation with state boards is to be, however, only one of the duties of the federal board. It is to act as a central investigative and publicity agent in the field of vocational education. The commission early agreed upon the need for such a body. In the reports of the Bureau of Labor Statistics, the Department of Agriculture, the Department of Commerce, and the Bureau of Education there is much material of value to the cause of vocational education. But the activities in this field of these departments necessarily lack plan, and are without relation to each other. Moreover, except for the work of the Department of Agriculture, Congress has not supported this service liberally.

Accordingly the new board is to be a clearing house for these departments and bureaus in making studies and publishing data. The board may conduct investigations of its own, but it is directed to work with or thru the departments so far as practicable. This phase of its work must include, the bill says, "studies, investigations, and reports on agriculture and agricultural processes and requirements upon agricultural workers; trades, industries, and apprenticeships; trade and industrial requirements upon industrial workers, and classification of industrial processes and pursuits; commerce and commercial pursuits and requirements upon commercial workers; home processes and problems and requirements upon home workers; and problems of administration of vocational schools and of courses of study and instruction in vocational subjects." To pay for investigations and maintain its office, the board is granted $200,000.

The creation of the commission which framed this bill came as the result of six years' effort to secure federal aid for vocational education. Under the leadership, first, of Representative Davis of Minnesota, and later of Senators Dolliver of Iowa, and Page of Vermont, the struggle

progressed. Senator Page has been particularly active in urging consideration of the subject and has in fact given more time, thought, and hard work to the measure than any other man in Congress.

The work of the National Society for the Promotion of Industrial Education, of which Secretary of Commerce Redfield is president, and Charles A. Prosser, until recently, its secretary, has exercised notable leadership in the movement for industrial education and its right development. This organization has been largely responsible for the development of the principles and policies which have guided legislation for the subject both state and national.

Altho the Page Bill passed the Senate at the last Congress, it failed in the House. Meanwhile the Lever Bill which granted federal aid to extension work among farmers, passed the House, and the two measures died in joint conference.

In January, 1914, Congress created a commission "to consider the subject of national aid for vocational education and report their findings and recommendations." Pursuant to this act the President appointed the following persons to serve as members of the commission:

Senator Hoke Smith, Georgia.

Senator Carroll S. Page, Vermont.

Representative D. M. Hughes, Georgia.

Representative S. D. Fess, Ohio.

John A. Lapp, director, Indiana Bureau of Legislative Information, Indianapolis, Ind.; secretary of Indiana Commission on Industrial Agricultural Education, 1912.

Miss Florence M. Marshall, director, Manhattan Trade School, New York City; member of Massachusetts Factory Inspection Commission, 1910.

Miss Agnes Nestor, president, International Glove Workers' Union, Chicago, Ill.; member Committee on Industrial Education, American Federation of Labor.

Charles A. Prosser, secretary, National Society for the Promotion of Industrial Education, New York City.

Charles H. Winslow, special agent, Bureau of Labor Statistics, Washington, D. C.; member of Massachusetts Commission on Industrial Education, 1906-1909.

This commission did two very remarkable things. It finished its report on time, and turned back into the Public Treasury one-third of the $15,000 appropriated for its expenses. The report while an exhaustive one presents unusually interesting data and arguments in support of its recommendations.

WASTAGE OF OUR YOUNG PEOPLE.

The commission found a tremendous wastage of youth. Almost universally in the United States boys and girls may leave school at 14 years or earlier to go to work. At least 2,000,000 boys and girls in this country between the ages of 14 and 16 are working for wages. They are unskilled at that age and unable to take responsibility. Each year 1,000,000 young people are required simply to maintain the ranks of our working population. The problem of vocational education is the problem of equipping for the successful pursuit of some useful trade.

The commission found that there are 25,000,000 persons in this country, eighteen years of age and over, engaged in farming, mining, manufacturing, and mechanical pursuits, trade and transportation. Of the 14,250,000 engaged in manufacturing and mechanical pursuits, not 1 per cent have had, or at the present time have any chance to secure, adequate training.

ECONOMIC VALUE OF EDUCATION

An ingenious computation is presented by the commission to show the value in dollars and cents which vocational training could have been to the 25,000,000 over 18 years of age now engaged in farming, trade, and industry. Says the commission:

> If we assume that a system of vocational education, pursued thru the years of the past, would have increased the wage-earning capacity of each of these to the extent of ten cents a day, this would have made an increase of wages for the group of $2,500,000 a day, or $750,000,000 a year, with all that this would mean to the wealth and life of the nation.
>
> This is a very moderate estimate, and the facts would probably show a difference between the earning power of the vocationally trained and the vocationally untrained of twenty-five cents a day. This would indicate a waste of wages, thru lack of training, amounting to $6,250,000 every day, or $1,875,000,000 for the year.

In this whole country, according to the investigations made by the commission, are fewer trade schools than exist in the now unfortunate little German Kingdom of Bavaria, with a population but little greater than that of New York City. Until the outbreak of the European war more workers were being trained at public expense in the city of Munich than in all the larger cities of the United States put together, altho these American cities include a population of 12,000,000.

Vocational training is required to conserve and develop our natural resources. These resources are decreasing. Successful competition with foreign countries in the future will depend upon our ability to "sell more brains and less material."

Despite the fact that the average intelligence is very high here, perhaps higher than elsewhere in the world, we have begun to lower it, because our vaunted system of universal education takes no heed whatever of the youth who go to work. Large-scale production, the extreme division of labor and the "all-conquering march of the machine," have practically driven out the apprentice system which, in a simpler age, taught the young not only details, but complete crafts. So, for the training which the trades themselves once furnished, we now must substitute school training.

The returns of the old trade, technical, and apprenticeship schools, showed that the wage-earning power of their graduates steadily increased in direct ratio with their learning. This mind development is wealth creation, as certain as mine development. We must remember this, and we have not been doing so.

The increased demand for trained workers is an irresistible urge toward vocational training. The supply is relatively diminishing with the constantly increasing demand upon our industries for more and better goods. The European war and its disastrous results will be certain to emphasize this situation.

The unexampled prosperity of the American manufacturer, too, has been due to the abundance and cheapness of the raw material, which he has found at hand; second, to the inventive genius of the American people; third, to the presence in the American brain of organizing ability leading to production on a large scale, and, fourth, to the presence in this country of a great body of cheap foreign labor of the first generation, working its way upward to civic and industrial worth.

The opening of new foreign sources of supply and the depletion of our own stock of virgin raw material; the deterioration of the quality of cheap labor coming to us from Europe, both tend to make action imperative to our welfare. In proportion as our resource factor fails, we must increase the efficiency of human labor in the shop as well as on the farm, says the commission.

TRAINED INTELLIGENCE NEEDED.

Only trained intelligence can conserve our mines, our forests, and our water powers; only trained intelligence can restore to our depleted

land its old fertility; only trained intelligence can make it possible for us to maintain our higher standard of living for workers, and yet successfully compete with workshops in lands where lower standards prevail.

The greatest resource of any nation is the undeveloped skill and vocational possibilities of its population. We must work this as industriously as we have worked our water power, our mines, our fields, and our forests, but with less waste and more intelligence. It is pointed out by the commission that vocational training is especially needed to prevent waste of human labor, which is the most destructive form of extravagance of which a nation can be guilty. Secretary Redfield stated recently:

> We are among the world's great industrial peoples, striving mightily for our place in the commercial sun. We need that place to keep our workmen employed and their families happy, but we omit a necessary thing to win and hold the position for which we strive. We train the physician for his job, the lawyer for his profession. We teach the veterinary how to care for the horse, and we even expect a dog doctor to know his job. With exceptions, excellent indeed, but all too rare, we are letting the city boy and the mechanic's son go it alone. We are so busy with winning our way, so concerned with our own national, state, and local affairs that a great problem like the wasting of our youths has been almost untouched.
>
> Hence it has come to be that years of a young mechanic's life are wasted in the learning how to earn his living after he has reached the time of life when it is his desire and duty to earn that living. Here is a weakness and a waste that may well alter the place of the United States in the commercial and industrial world.

National grants are justified by the interstate character of the problem of vocational education, due to the interstate character of our industries and the national character of state business and industrial life. Because of its extreme mobility labor, particularly that which is skilled and is therefore in great demand, has taken on a national character. A man may be born in Indiana, trained as a worker in Massachusetts, and spend his days as a machinist in Calofirnia. A state can not be expected to devote large sums from her public revenues to the making of good workmen for the benefit of other states. Only out of a common fund like the national treasury can the burden be equalized and adjusted so that each state may in justice be expected to meet the obligation resting upon its schools.

Abundant precedent for national grants to education is found in the grants given under the old Morrill and Nelson Acts to colleges of agriculture and mechanic arts. Probably no aid given by the national

government for education has ever proved so fruitful as have these grants. New and vigorous colleges have been created, small and feeble state institutions have been awakened into new life, the agricultural and engineering professions have been developed, and the states have been stimulated to make large and rapidly increasing appropriations to these colleges and to their state universities.

The Smith-Hughes Bill in effect proposes to extend to the boy and girl of less than college grade opportunities for training in the vocations into which our young people are going at the rate of more than one million a year.

So here we have the United States coming forward with what, at least, is the most ambitious plan for educational advance likely to be carried out anywhere in the world during the immediate future. While Europe is killing off its trained workers, we are preparing to train ours.

> THE TRAINING OF A PEOPLE DEMANDS MORE [THAN BOOKS AND LECTURES]. IT MUST ACCUSTOM THE BOYS AND GIRLS TO DIRECT, AS FAR AS THEIR NATURE ALLOWS, NOT ONLY THEIR THOUGHTS AND FEELINGS, BUT ALSO THEIR ACTIONS IN ALL CRITICAL POSITIONS, TOWARDS THE SERVICE OF COMMON INTERESTS. * * * ONLY IN SUCH A SCHOOL DOES THE OLD MAXIM OF THE EQUALITY OF MANKIND ATTAIN ITS REAL ETHICAL SIGNIFICANCE; AND THERE ALONE IS A RIGHT CONCEPTION DEVELOPED OF THAT ASSOCIATION FOR MUTUAL AID WHICH WE CALL THE STATE, WHOSE POWER IS FAITHFUL JUST SO LONG AS IT CAN RANGE AS MANY AS POSSIBLE OF ITS MEMBERS IN ITS SERVICE TO PERFORM SOCIAL DUTIES AT THE COST OF THEIR SELFISH INTERESTS. I SHOULD LIKE, THEREFORE, TO STATE THE PROBLEM OF POPULAR EDUCATION IN THIS FORM: IT IS THE SYSTEMATIC TRAINING AND ORGANIZATION OF THE PEOPLE TO TAKE PLEASURE IN ACTIVE CONSTRUCTIVE WORK FOR THE COMMON GOOD.—Dr. Georg Kerschensteiner.

THE ORIGIN AND GROWTH OF THE MOVEMENT TO TRAIN TEACHERS OF SALESMANSHIP.

(Concluded).

Cassie L. Paine.

At the present time the Union School of Salesmanship instructs three classes a year. Each class consists of about thirty salesgirls, who come from six cooperating stores in Boston. These girls attend school five forenoons a week from 8:30 to 11:30 for twelve weeks. The course of study consists of salesmanship, including demonstration sales; arithmetic; English; textiles; color and design; hygiene; economics, as related to income, expenditure and savings; merchandise; and saleslip practice. In every case the subject-matter is adapted to the particular needs of the group and made practical in the highest degree. No textbooks are used, and no home study is required, but often the interest and enthusiasm of members of the class lead them to ask for direction in outside study. The class exercises emphasize the principle of self-activity among the individuals and much discussion and frank criticism are carried on. Frequent lectures by prominent business and professional men and women are given upon topics related to business, such as waste or service, or those related to health, both public and private, or those connected with social and economic problems of the present day, such as woman's suffrage, the work of the Consumers' League, etc. The commercial value of the training has become so evident to the employers that they now encourage their most promising employes to take the training. At first they selected those employes whom they would "miss least." The opportunity to attend the school is now looked upon as a privilege by the employes themselves and there are many requests to take the training.

A great deal of individual welfare work is taken up with these salespeople, both while they are attending the class and afterwards. Physical as well as mental needs are discovered, and help given. Appointments with physicians, dentists, oculists, chiropodists, etc., are frequently made, and school time is given for the filling of the appointments. The home and living conditions of the salesgirls are known to the instructors in the school, and often beneficial changes are made there. The reading, amusements, special talents or inclinations, general use of leisure time and particular problems of life of the individual salesgirl are matters of concern to the teachers to whom the salesgirls go for help. Both while

they are taking the course and for several months afterwards, the girls' work in the store is followed closely by the instructors thru direct observation, and thru conferences with them individually and with those people in the store whose duty it is to know of the quality of work of the salesgirls. A carefully made out record card giving complete information concerning her school and business life is started for each girl while taking the course. These cards are kept on file at the school, and upon them are recorded each year the changes in the work and wages of each individual. In this way her promotions both in kind of work and in wages are watched by the teachers thru whose direct efforts a girl is frequently helped to advance.

From the first, a few of Boston's most progressive business men gave good advice concerning the direction that this educational work should take. This body of men was early formed into an advisory committee to assist Mrs. Prince in shaping the policy of the school. That committee, now consisting of the superintendents of all the stores cooperating with the school, together with the president of the Union and the director and instructors of the school, meets regularly three times a year to discuss the problems of the movement and shape new policies for the school.

COOPERATION WITH SIMMONS COLLEGE.

This, in brief, is the history of the direct line of educational work with salesgirls that was started ten years ago in Boston. But the ramifications of this movement are already so numerous that it seems quite impossible, in an article of this length, to mention all of them. Perhaps the most important outgrowth of the work, educationally, is the establishment of a department in Simmons College for the training of teachers of salesmanship. This movement also has come about thru the cumulative force of many influences. In the educational world, the need of industrial and vocational training was becoming more and more apparent. Educators began to realize that when the boys and girls left school, they entered a great variety of occupations. With this realization came the discovery that a surprisingly large percentage of young people in the large towns and cities enter mercantile houses. At the same time, in the business world, more efficient methods were disclosing the relative superiority, economically, of trained over untrained individuals. Consequently, this experiment of training salespeople in Boston began to be watched by educators and far-seeing business men thruout the country. When evidences of the practicability of such a scheme began to be shown,

these men wished to have the same kind of work done in their particular store or city. Of course there was no one better fitted to undertake such a problem than Mrs. Prince, and she, fortunately, could not be induced to leave the work in Boston which was then in its infancy. The business men were not satisfied to let the matter drop, however, and begged Mrs. Prince to show some candidates of their selection how she did it, if possible. As early as 1909 a young woman came to the school and worked with Mrs. Prince for a few months, having been promised a position as educational director in a large store at the end of her training. This shows that the demand for this kind of education came first from the business world.

With the rapid growth in importance of the work of training salespeople and the consequent increase of responsibility in giving wise direction to this movement, Mrs. Prince felt it would be helpful to study the different kinds of vocational and industrial schools in Germany. Consequently, in January, 1910, she left her school in Boston in charge of a young woman who had assisted her since the previous September, and went to Germany to study the vocational schools there. During her visit abroad, she found nothing being done to educate salespeople except in two large cities where courses of lessons on merchandise were given. She returned to Boston more fully convinced than ever that the instruction of salespeople was a new movement in education that had come to stay, and she began to see the possibilities and great probabilities of its place in the regular public school organization. Consequently the need of trained teachers for this work began to open up a new phase of the movement that at first was not thought of.

TRAINING TEACHERS AND DIRECTORS.

The quality of the people who should take the training for teachers became an important factor to consider. The work was entirely new and practically unheard of except around Boston. It must be introduced in each new locality by a person of tact, foresight, and wisdom. The material for instruction, while found in great quantities in home and business life, was at that time little organized. The person undertaking the work must have a keen discrimination and a thoro sense of the practical in business affairs. The backbone of the work was education thru good teaching. To be successful, a person must know something of the workings of the human mind, of the laws that control mental activities, and of the principles by which those laws can be used to ad-

vantage in increasing the intelligence and ability of the pupils. Therefore the projector of this new educational movement must be someone who could *teach* in the best sense of the word.

From the first, Mrs. Prince demanded of those women who wished to become teachers of salesmanship, a well-trained mind, a broad educational background, an interest in and some knowledge of the business world, a broad human sympathy, and an aptitude for teaching. Such women are most likely to be found among college graduates, and in September, 1910, three Wellesley College graduates were allowed to study the work of the School of Salesmanship under Mrs. Prince's direction. They were all quickly placed in stores or schools to teach salesmanship.

The demands for trained teachers of salesmanship continued to come from business men in Boston and from other parts of the country. The value of introducing salesmanship into the public schools continued to be agitated by educators, and Boston decided to put the subject into one of her largest high schools to test its practicability. Applicants who wished to prepare for the work continued to plead for an opportunity to do so. During the year 1911-12 five women studied with Mrs. Prince. One of these women was sent by one of the best stores in Cleveland, to take the training at the expense of the firm. Another, a public school teacher, was sent at the expense of the city of Cincinnati by Dr. Franklin B. Dyer, who was then superintendent of schools in that place, but who at the present time is superintendent of the Boston public schools. A third member of this group was appointed in June, 1912, as teacher of salesmanship in the Girls' High School in Boston.

With the introduction of salesmanship into the Boston high schools, and the consequent influence upon high schools in other cities thruout the country, with the sure approach of continuation schools in Boston having salesmanship as one of the essential subjects of instruction, and with the increased demand for trained instructors in the stores, it was seen that the teachers' course in salesmanship was to be a most important part of the whole movement. Consequently in September, 1912, a teachers' class in salesmanship was formed with a regular instructor and a definitely organized one-year's course of study. The class consisted at first of five women, graduates of three different colleges. During the year four other women entered, making a group of nine teachers trained that year. These women spent the forenoons with the class of salesgirls at the Union School of Salesmanship, observing, criticising, and participating in the teaching of that class. In the afternoon they met for dis-

cussion of the forenoon's work and for the study of the academic and professional subjects of the teachers' course. One day each week the teachers sold or did other work in a store. They also followed closely all the store work of the salesgirls in the class and made themselves as familiar as possible with organization, system, rules, customs, and principles of the stores in which these girls worked.

The type of young women taking this training, the quality of their work and the eagerness with which they were sought for during their course by school and store superintendents attracted the favorable attention of the corporation of Simmons College. This institution, a unique technical college for women, was established in Boston about fifteen years ago. From the first it had cooperated with the Women's Educational and Industrial Union in its effort to promote the progress of women, and had used its various offices and workshops as laboratories for the students while pursuing their college courses. The practicability and permanence of the work in salesmanship appealed to the members of the corporation of Simmons College, and in 1913 the teachers' course in salesmanship with the instructor and Mrs. Prince as the director was taken over by the college.

The first class to be officially associated with Simmons began work in September, 1913. The course of study remained practically the same and is the one being used at the present time. It consists of textiles, applied psychology, education and economics. The work in these subjects is planned to furnish a broad background of information as well as to give practice in the selection and organization of subject-matter suitable for the instruction of any group of salespeople. In textiles, the production, manufacture and uses of the fibers are studied in detail. An attempt is made, also, to get a broad, comprehensive view of the conditions surrounding the production of cloth so as to see their influence upon some of the great social, industrial, and economic problems of the present day. The work in psychology involves a review of its fundamental principles and their application to various department store methods. Many ordinary business situations are analyzed in order to discover the psychological laws operating therein. The subject of education has for its purpose a critical study of classroom exercises, lesson plans, teaching principles, courses of study, etc. In economics, emphasis is placed upon the greater economic value to business of the efficient individual, and a search is made for the many influences that should contribute to the efficiency of the department store employe.

The field work of the teachers' course continues to broaden. The students work in stores during the month of December and are often called upon by the stores in Boston for special services. They visit shops, mills and factories to see conditions under which labor is carried on and try to discover the needs and opportunities of the employes. They make themselves familiar with the organization and system in small stores and specialty shops, as well as with all the different divisons of work in large department stores. They engage in research work upon practical topics connected with their regular college subjects, such as "The Origin and Growth of Welfare Work in Department Stores," "The Direct Influence of the State Board of Health upon Department Store Employes," "Labels, their Origin and Meaning," etc.

DISTRIBUTION OF GRADUATES.

In the class of 1913-14 there were twelve members. They quickly secured positions and are now distributed over the country, two being in California, one in Maryland, and most of the others in the large cities of the middle West. The class of 1914-15 numbers twenty-five at the present time, May, 1915. These young women represent nine different colleges, and four different normal schools. They come from twelve different States in the Union. Their experience is quite varied, most of them having taught, some having had a large business experience, and others a wide experience with life and the world as a result of much travel and study. Two of these teachers are being sent, and their expenses paid, by the stores in which they are to be employed. One is on her sabbatical leave of absence. The enthusiasm of these young women for the work, the strength and vigor with which they attack it, the wealth of their experience, and the initiative they show in this new field of activity are certainly favorable indications of the healthy growth of salesmanship under their direction. Several of these young women had already obtained their positions for next year before the course was half completed.

There seems almost no limit to the possibilities of this kind of training in the future. Based as it is upon fundamental educational principles, carried out as it is by women of culture, vision and ability, contributing as it does to the best interests of business, it can be modified and adapted to a wide variety of places in business and industry. Already this course in salesmanship is being taught in all of the general high schools in Boston. Several other large cities are seeking teachers for the

same purpose. It is being taught in the continuation schools of Boston, Cincinnati, Milwaukee, Troy and Waterbury, and in the stores of ten large cities in the country. In one case a teacher has adapted the course with great success to the employes in a factory.

In the store work alone there lie all sorts of opportunities. Only the salespeople were at first selected for improvement and the course was made primarily for them. But there are many other groups of workers in large stores who are equally inefficient and equally unintelligent concerning the opportunities and possibilities of their particular jobs. The wrappers, or bundle girls, the cash boys and girls, or cashiers, the stock people, the packers, the drivers, the markers, the floor men and women, and even the buyers are in most cases in need of just the awakening, the information, and the inspiration that this course, adapted to their particular needs, can give. In most of the stores where the teachers are directing the educational work there are classes for many other groups of employes besides the salespeople. There seems no reason why this course may not in the future be adapted to the needs of employes in mail order houses, wholesale houses, and branch business houses in foreign countries.

The teaching principles and much of the subject-matter of this course in salesmanship could be adapted to the great army of factory and shop workers. A member of the present class is studying the possibilities of such an adaptation. One of the graduates is already doing pioneer work of this kind in a factory in the Middle West and is firmly convinced of its efficacy. What a field of service may be opened up here!

It is impossible at this time to forecast the outgrowths of this experiment in education begun in Boston ten years ago. We can record only the accomplishments up to the present time, and point out only the directions which the present tendencies are taking. There seems no doubt that the movement to educate employes in a store has come to stay. It also seems probable that this movement will eventually enter other lines of industry. And the fact seems to be established beyond dispute that an increase of education among any group of workers leads to an increase of efficiency.



A COURSE IN TYPOGRAPHY, PROOFREADING AND COPY-EDITING.

ARNOLD LEVITAS.

AT the Stuyvesant Evening Trade School in New York City there is a class in typography and proofreading. Its aim is to give the printer that necessary education which he was unable to get either at the shop or at the trade school—that education which leads toward greater opportunities in the trade, and which would ultimately result in the broadening and developing of the industry itself.

The value of the course has been recognized by the rank and file in the trade thru the good results which the course has already brought in evidence. Dr. Frederick W. Hamilton, National Apprentice Director of the Typothetae, has said of the course: "It is a successful attempt to instruct printers in matters which are of the utmost importance to them, but which they would find it very difficult, if not impossible, to learn unless some such special agency were provided."

The development of an industry lies in the greater efficiency of its component parts—the men who are producing the work; and the greater efficiency of the workingmen will come through intelligent study of the elements with which they deal.

For the purpose of preparing the printer for the task which is

awaiting him, the class of typography, proofreading, and copy-editing has adopted the following schedule of study:

I. Lectures (Monday and Wednesday).
60 Evenings—120 Hours.

1. Proofreaders' Marks (2 lectures).
2. Punctuation (8 lectures).
3. Marks of Reference and Accents (2 lectures).
4. Capitalization (4 lectures).
5. Division of Words (8 lectures)
   (a) English; (b) German; (c) French; (d) Spanish; (e) Italian.
6. Abbreviations and Contractions (3 lectures).
7. Compounds (7 lectures)
   (a) Compound Words.
   (b) Compound Nouns.
   (c) Compounds Other than Nouns.
   (d) Interrupted Compounds.
   (e) Solid Compounds.
   (f) Miscellaneous Compounds.
8. Grammatical Divisions and Subdivisions of the Book (1 lecture).
9. Making Up a Book (2 lectures).
10. Copy-Editing (1 lecture).
11. English in Modern Typography (3 lectures)
    (a) Simplified Spelling.
    (b) Distinction between American and English Spelling.
12. Orthography (9 lectures)
    (a) Derviatives; (b) Final Consonants; (c) Plurals;
    (d) Miscellaneous Rules.
13. Synonyms and Antonyms (1 lecture).
14. Homonyms (1 lecture).
15. Rules of Geographic Board (1 lecture).
16. Indexing (1 lecture).
17. Computation of Space (1 lecture).
18. The Practical Procedure in the Proofroom (2 lectures)
    (a) Proofroom Rules and Regulations.
    (b) Methods of Procedure.
    (c) How to Consult Reference Books.
19. The Typographical and Editorial Construction of the Magazine and Book (2 lectures).
20. Modern Methods of Typography (1 lecture).

II. Practical Work. (Tuesday and Thursday).
60 Evenings—120 Hours.

1. Galley Reading (16 hours).
2. Ad Reading (20 hours).
3. Proofreading by Copy (16 hours).

4. Revising (10 hours).
5. Page Reading (10 hours).
6. Final Reading (10 hours).
7. Editorial Reading (10 hours).
8. Proof Criticisms (20 hours, 10 lectures).
9. Preparation of Manuscript (8 hours).
10. Question Box.

In general the method of instruction is as follows:

The course is divided into lectures and practical work—60 evenings of each. The lectures, on Monday and Wednesday evenings, include all the subjects enumerated above. The most important rules are written on the board for the students to copy. All rules are thoroughly illustrated and discussed from the editorial, typographical, and grammatical viewpoints. The present methods prevailing in modern printing and publishing houses, and the differences of opinion of printers, lexicographers, and authors are also taken into consideration.

The textbook used for the course is a compilation by the instructor, consisting of about 1,500 pages of manuscript—rules and illustrations. This manuscript includes all the subjects in the schedule of study mentioned before.

Two evenings each week are devoted to practical work on proofs. Here the theoretical study of the lectures is applied to practical demonstration.

Proofs are read first for typographical errors, then for the grammatical construction, and finally by copy. These proofs are openly criticized four times during the month, all students participating in the discussions. In second reading and final reading, the students criticize each other's proofs. Everything is done as nearly as possible to get the practical results of the printing office. Another feature is the question box, fifteen minutes each evening being devoted to the answering of questions propounded by the students. For the past three years this work has proved to be very successful from every point of view—fulfilling as it did a need which was long felt among printers and their employees.

THE NON-COMMISSIONED OFFICER IN INDUSTRY.

MERLE HIGLEY.

AN educational interpretation of the phrase "non-commissioned officer in industry" first appeared in a study of the Boston Mechanic Arts High School which was in the form of a report made to the Boston school committee. The object of this report was "to determine to what extent the school was effectively performing in the school system the purpose intended by the committee of preparing boys for advantageous entrance to industry on the business and directive side."[1] Training for this position was stated by the school committee to be "that which aims to give thru a school of secondary grade both the technical knowledge and the elementary experience in certain industrial processes which will make the pupil 'industry and business wise' as a preparation for favorable entrance as a non-commissioned officer in industry looking to promotion and leadership on its business and directive side." The term "non-commissioned officer" was used "to mean a subordinate executive or assistant on the business and directive side of productive industry."[2]

The recommendations made in this report, together with analysis of positions held by graduates of various Boston high schools and of the content of the curriculum as preparation for these latter positions, represent the first attempt to analyze a new field of training and employment. However, this report did not go into industry to analyze its varying opportunities and needs in such directions. The Minneapolis Vocational Education Survey made such an investigation of training needed for leadership in the industries of the city and as a result of that investigation, a technical course for non-commissioned officers in industry has been organized in Central High School.

Varied methods were employed in making this investigation. First, a questionnaire was sent to firms in the city in both productive and distributive lines of business asking for the names of positions in the plant and office between those of the ordinary worker or journeyman and the highly trained mechanical expert. With this was enclosed for explana-

[1]"A Study of the Boston Mechanic Arts High School," C. A. Prosser, Ph. D., Teachers College, Columbia University, New York City, 1915; p. 5.

[2]Ibid, p. 15.

tion a partial list of such positions in factories and manufacturing plants, electrical manufacturing, architectural work, and chemistry. Conferences were held with men in both the important directive positions in industry, in the intermediate subordinate executive and assistant positions, and with the workers in the directly productive part of the industry. In addition all pertinent information gained by investigation of special trades and industries was made part of the final report.

The investigation showed that no sharp line of demarcation could be made between the commissioned and non-commissioned officer in many industries at least. It also showed that no definite line of promotion is followed from the lower to the intermediate grades of position, and no definite scale of increase of salary results. Usually promotion is due to long and faithful service, coming at middle age, and in most cases, the individuals receiving such advancement lack the necessary technical and business preparation to enable them to progress to the $200 to $500 positions for which their promotion puts them into direct line. A smaller number in this group owe their positions to personal initiative in analyzing problems of their work, in gaining additional training thru correspondence schools and night school courses, and a still smaller number have had thoro preparation along some technical line. The salary range for this intermediate group was found to lie between $75.00 and $200.00 per month.

Any outline of the various positions found in the industries of the city would neither be interesting or suggestive. Various positions as superintendents, inspectors, chief and assistant salesmen, draftsmen, engineers, operators in electrical and telephone work, surveyors, foremen, master mechanics, efficiency men, stock clerks, yard men, and purchasers of supplies were found in large numbers, and in many and varying lines of industry. An estimate of the field of opportunity for persons possessing the necessary training is shown by the number of people engaged in such positions in the city, which was, according to the United States Census Report on Manufactures for 1909, about 3500.

Here, as in Boston, it was found that a certain number of graduates of the manual training courses in the high schools had successfully gone into industry in this side. Taking this into consideration, together with the analysis of needs and equipment which such positions require, which was made by directive officers and incumbents of such positions, a course was organized which would meet the promotional needs and furnish the technical knowledge required by such a group.

The board of education has established such a course in the Central High School which provides for practical experience in brick, cement, concrete, and paint industries, woodworking, pattern-making, and cabinet-making, forging, sheet metal, steam, gas, and electric power, together with courses in drafting and design, strength of materials, cost estimating, and transportation. The academic subjects included in the course are English, penmanship and spelling, general and industrial history, elementary algebra, plane geometry, shop mathematics, commercial arithmetic, physical and commercial geography, physics, chemistry, economics, and civics. In order to cover such a full course the school has been lengthened to seven hours.

The Civic and Commerce Association is cooperating with, and heartily approves of the plan. Thru its board of directors and a special committee a plan has been inaugurated by which the employers of the city agree to take the graduates of the technical course at a beginning salary of not less than $50 per month. The school authorities are now engaged in working out this plan. All information given and opinions gathered indicate most conclusively that rapid promotion with increased opportunity for service, responsibility, and reward await the graduates of such a course in the varied industries of Minneapolis.

THE REAL CAUSE OF THE PRESENT AMERICAN TENDENCIES IN EDUCATION IS THE NEW AND COMPLETE DEPENDENCE OF MODERN INDUSTRIES, COMMERCE AND GOVERNMENT ON APPLIED SCIENCE WORKING THROUGH MECHANICAL POWER, MACHINERY, THE WISER UTILIZATION OF NATURAL RESOURCES, AND THE VARIED SKILLS WHICH HUMAN BEINGS MUST POSSESS IN ORDER TO DIRECT THESE NEW AGENCIES.

—Charles W. Elliott.

THE BY-PRODUCT OF AN EDUCATIONIST.

By H. Williams Smith.

I AM sending four or five pictures to America, and a few written notes to accompany them; but the pictures are about all that matters. You will get from them, perhaps, a few impressions such as words cannot convey. They will give you some ideas of the originals from which they were taken: perfect examples of English craftsmanship, as sound in construction as they are beautiful in decoration. The photographs given are taken from typical specimens of about twenty-five pieces of furniture, all the work of one man's hands, and that man an active English educationist, who has devoted some of his scanty leisure time in the past quarter of a century to the making of them. Before Mr. S. Barter, the inspector of manual training for the London County Council, began to teach, he had climbed practically to the summit of craftsmanship in wood. Thru his hands had passed the



BOOKCASE.



MUSIC CABINET. PHOTOGRAPH BY J. PACKHAM.



PEDESTAL AND TABLE. PHOTOGRAPH BY J. PACKHAM.

best work in a city which produces joinery and cabinet work unchallengable for excellence by any other part of the world. He entered the educational field, then, a master of craft. The drawers he fitted expelled the air audibly as you pushed them in. If you shut up on a bit of tissue paper the doors he had hung, you could not withdraw that paper from the joint. Was manual training the better that one of its pioneers had been trained to such skill of hand, such exact workmanship, such conscientious handicraft? I believe so.

Those twenty-five pieces of furniture have been something else besides the tangible results of a certain number of leisure hours. To the making of them day by day was submitted the proof of their maker's educational theory and practice. They kept him in balance. They kept him down to the tools. They prevented him from becoming too academic. They helped to keep him what too many educational directors and supervisors are not—a man of the world, a competent organizer, and an efficient, sane, determined leader.

One of the things about Mr. Barter's furniture not least interesting to me is his courageous and lavish use of ornament. A lesson is to be drawn here. I think you cannot help observing that in English and American manual training design there is a perceptible shirking of ornament. We all have a dread of ostentatious ornament, and one result of this is that our construction is far too ostentatious. Our stools and tables proclaim the virtues of their mortises and tenons in somewhat irritating fashion. I need hardly state that I recognize the inevitable necessary simplicity of juvenile handwork; but I wonder if presently the standard of adult handwork may not deteriorate in consequence. At present the Americans and English seem afraid to decorate, so far as educational handwork and especially woodwork is concerned. Mr. Barter's work, to my mind, points to a better way. His construction like that of the human body combines beauty with utility, and over all he has put, as there is over the body, a beautiful skin. His decoration of surface is lavish, but it never conflicts with the dominant design and evident purpose of the article. In his ornament he depends much on form but mainly on color—those unsurpassable color effects of wisely selected woods in juxtaposition with their form and tints brought out to the full by the magical touches of the polish-rag. In its place, a piece of that furniture is as much a work of art as a piece of music by a great master. What is a fugue by Bach or a variation by Beethoven but a construction elaborately decorated, yet one where the dominant theme keeps ever all the flourishes and flamboyances in their due place?



CHINA CABINET. PHOTOGRAPH BY J. PACKHAM.

I want these pictures to plead to you for more courageous decoration. I know it is better to under-do decoration rather than to overdo it, but I contend that it is better to overdo it rather than not do it at all.

On a day in the summer holidays of 1914 when war was throbbing in the air, I sat hushed to a great peace, under the grateful shade of the trees, looking at the divine beauties of Canterbury Cathedral, that chief

glory of the Mother City of our English race; aye, and for all your cosmopolitanism, of you Americans too. Divinest beauty of all is the great central tower. It is called the angel tower, and I can only say that if the angels build like this, heaven will be good enough for me. It lifts its great mass to the skies, and with it lifts the soul of every man who looks upon it. It is lavishly decorated. From it the eye glances to one of the earlier Norman towers, and the contrast is almost ludicrous. The Norman tower looks in comparison like the work of a child composed of the materials afforded by the box of bricks which was not one



SIDE-BOARD.

of the least blessings conferred upon us by the Germans in our infancy. Yet (this is what I am trying to get at) it had to be the Norman tower before it was possible to have the angel tower. Canterbury Cathedral and numberless other works of man give us at once proof and sanction for the fearless use of ornament. Mr. Barter's works in wood echo the high lessons of great architecture; supremely constructed and divinely adorned.

The articles represented in the accompanying illustrations comprise a music cabinet, a china cabinet, a pedestal, a book-case, a side-board, and a lady's work-table. The last is perhaps, for any who wish to copy Mr. Barter's designs, the most imitable of all; and it is a lovable little bit. It will be seen at a glance that the style of all the pieces is based on that of Sheraton, greatest of English cabinet makers; and that a perpetually recurring but as perpetually pleasing motive is the ellipse. Such work is veritably the apotheosis of the veneer.

And here it will be timely to say, that a dread of veneer is just as ridiculous as a dread of ornament. Veneer on wood construction is as justifiable as the skin on our bodies. Never mind if numerous rascals have veneered over rotten wood and scamped construction. That's their dirty business. All good things are liable to abuse. Mr. Barter has carried out his self-appointed task, actuated by the grand belief that "the gods see everywhere." I commend his work to the serious attention of his fellow inspectors and supervisors in America. I commend it



LADY'S WORK-TABLE.

above all to the emulation of your young teachers and ours. Believe me, young men, it is vitally necessary for you all to be increasingly "men of your hands." It is not enough to think about it, to talk about it, to write about it, but you must do it. It is not enough to plane and saw true surfaces and do a plain and honest job. The mind of man rightly demands beauty as well as utility. You may sit down to dine at a table of your own making on a chair of your own making, but your soul itself must feed on the table and chair.

I conclude by submitting Mr. Barter as an exemplar in all that pertains to manual training, and his works in wood as some of the best evidences of his great ability and sterling character.



FIG. 1. THE FORGE SHOP.

THE USE OF BLANK QUIZ SHEETS.

I. O. Royce.

THE Manual Arts Department of the University of Missouri is having a new situation to cope with. The students taking the short winter course in agriculture are allowed to elect forging and woodworking courses. There are many students taking these courses for the practical benefit they may get out of them, some intending to do blacksmithing on the farm, others being desirous of eliminating carpentry expenses on small buildings. The work must therefore be taught with these facts in mind, and so arranged as to give the highest efficiency possible in the time available.

In the forging department the work taught consists of recitations upon textbook assignments, lectures, observation of demonstrations which are accompanied by lectures, and the working out of the exercises as demonstrated. Fig. 2. By using the textbook long lectures and demonstrations are eliminated; a short, snappy demonstration and lecture is all that is necessary. The student having read an assignment on the demonstration before it is given, is in condition to grasp more readily the steps of the demonstration. He understands better what the result is to be and he takes more interest in seeing the exercise developed. The lecture accompanying the demonstration may be very brief, being only

an explanation of the most important points. The text may give several methods for working an exercise; then the instructor helps the student in selecting the appropriate one. This could be done in lectures, but it would be a waste of time already too short. Again, the text is a ready reference for the student and should serve as his hand-book. Besides the text, demonstrations and lectures, it is quite advisable to help the student out of his difficulties by individual instruction when he has come to something too difficult for him.

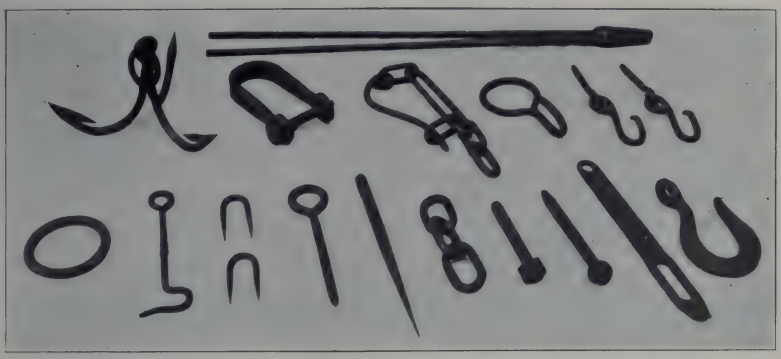


FIG. 2. EXERCISES IN FORGING.

The problem presents itself of getting the student to take interest in certain parts of the work. In order to encourage him to read and keep up on the demonstrations, an occasional quiz is found to be very helpful. But a quiz, as ordinarily given, takes up several minutes of a period when the men might be working on the exercises. To avoid the taking of too much valuable time the "blank quiz" has been found to be a success. The form of this quiz is simply sentences, original or quoted from the text, with an occasional, important word omitted, which is to be supplied by the student. Even sketches may be drawn and names of parts, or of the whole article, asked for. It is not thought advisable to require one particular word or name in each blank. Instead, the arrangement may be such as to allow of a selection of a word or name, or of a phrase expressing the proper idea. The accompanying quiz in forging, Fig. 3, is one that was actually given. For a quiz such as this, where each student is given a separate ready-written copy, only a very few minutes are allowed, and, in fact, only a very few are needed. The student is instructed first to read the paper, and then to proceed to fill

FORGING.

Two fuels used for blacksmithing are: (1)_____(2)_____

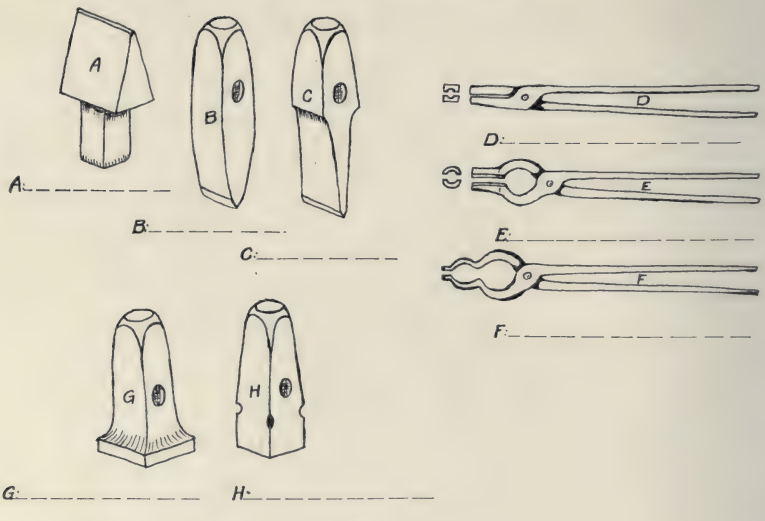
An oxidizing fire is one that does not use all the _____in the blast for the combustion of the fuel. The best fire for perfect heating is a_____fire.

Two common fire tools used by the blacksmith are: (1)_____ (2)_____

The steel face of an anvil has been_____in order that it may withstand the hammer blows. The round hole in the face of the anvil is called the_____hole. The_____hole is used mostly for holding bottom tools which have square shanks.

The three commonly used hand hammers are, on account of their shape, called: _____peen; _____ peen; and _____peen.

Give the complete names of the following tools:



A:_____ B:_____ C:_____ D:_____ E:_____ F:_____ G:_____ H:_____

FIG. 3.

in the proper words. It is found that for such a quiz as the one shown, four mintues is ample time. If a member of the class finishes his paper before the time is up, he may be given credit for his ability to think rapidly as well as correctly, the greater weight, of course, being allowed to the latter.

By use of such a quiz as this there is a saving of time, elimination of superfluous writing, and training to think rapidly. There is also an



FIG. 4. HOUSE FRAMING CLASS.

inducement to study the subject beforehand. Furthermore information may be acquired by the sketches used on these quiz sheets which would be difficult to get in other ways.

The courses offered in woodwork are such as may be of practical benefit. The elementary course consists of exercises which give the fundamental conceptions of woodworking and the tools used by the woodworker. The advanced work, or carpentry, consists of what is extremely practical. It includes lectures on the practice of the carpenter, and solutions of his problems as they are met. The problems are illustrated by having the men construct houses on a miniature plan, say a 5 ft. x 7 ft. flloor plan, Fig. 4. The word miniature does not apply to the building stock, since standard timber is used. The plan of procedure is to have the student make sketches of floor plans and details, and then work from these sketches in building the house. When time is sufficient the house is built by the student from sills to ridge-roll, assembling all

CARPENTRY EXAMINATION.

1. (a) Give dimensions of stock (neglecting length) of studding and joist for medium span. (b) Why should bridging be used?

2. (a) What is the usual spacing for studding? Why? (b) What is the usual spacing for overhead joist? Why?

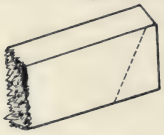
3. (a) If the bubble of the level, or plumb, is not accurately adjusted, what method would you follow in plumbing a corner post? (b) Give a method for testing a foundation for squareness.

4. (a) If a common double sash window has glass 24"X24", what opening should be framed? (b) If a door is to be 2'-6"X6'-6" what size opening should be framed?

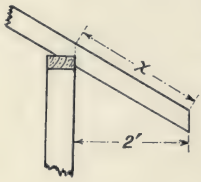


5. (a) For accompanying sketch of roof give: (1) length of span; (2) rise; (3) run. (b) Give pitch of the roof.

6. (a) If it is desired to lay out a rafter for ¼ pitch, what numbers should be taken on the blade and tongue of the square, and on which would you scribe for plumb cut? For seat cut? (b) If the run of a common rafter is 8 feet and rise 4 feet, what numbers should be taken for plumb cut of hip rafter?



7. With a similar sketch of a hip rafter, illustrate by adding such lines as necessary for side cut of hip rafter and describe how you determine them.



8. If the roof is ⅓ pitch, give a method of determining the length of X, if the horizontal projection is 2 feet as shown in diagram.

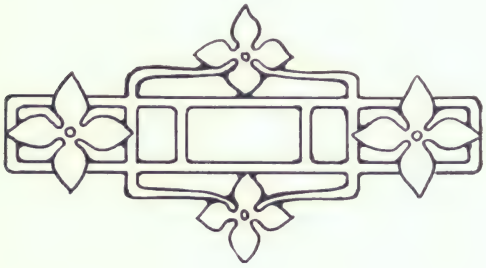
FIG. 5.

the framing in a manner similar to that followed in modern house building. The points dwelt on at length are size of stock, spacing of timbers, methods of assembling, laying out stock, computation for openings, framing openings, use of square in framing roof, etc., etc. The set of "final" questions here shown, Fig. 5, may give some idea of what the student is expected to learn.

It is found advisable to have the men divided into groups of say four men. Each group works on only one house. One man may be assigned a side of the house, and is there to meet his share of the available difficulties. A fifth man may be added as a sort of helper and, to some extent, an overseer, or boss.

When the course is handled in this manner the men are found to take a great interest, as well as some pride in their work.

Note. The blank quiz and final questions here shown are supplied to the students so that each has a copy. This is very easily accomplished by means of hectagraph copies of the questions. This is found to be a very economical method of making duplicate copies and, if the hectagraph is properly operated, it is very satisfactory.



SIMPLE UPHOLSTERING.

(Continued).

Emil A. Johnson.

AS a continuation of the work presented in the November, 1914, issue of this magazine, I shall here describe the making of what is technically termed the hard edge seat. This is quite simple as compared with some kinds of work in upholstery, but it is really the most important. The edge of the seat has to be stuffed and sewed in such a manner as to make it hard and firm, while the center is springy. With

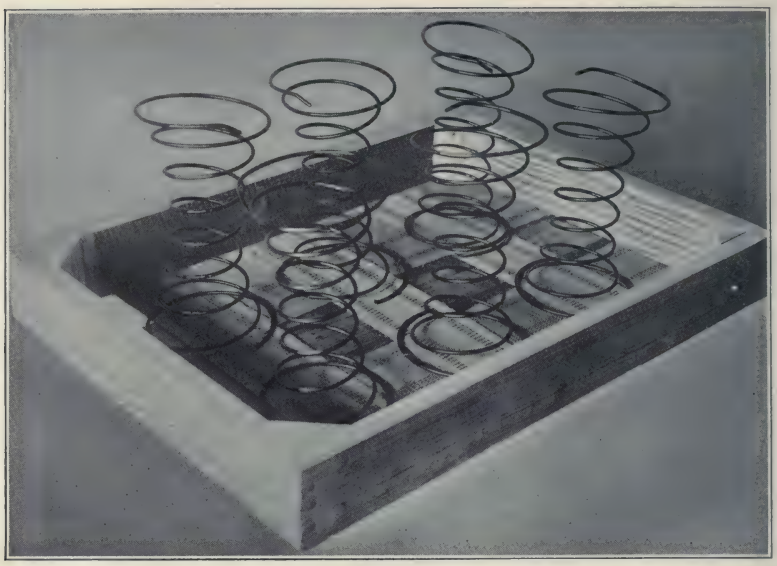


FIG. 12.

a knowledge of this class of work one can upholster some of the finest pieces of furniture.

I shall be specific and describe the making of a seat for a cricket, adding only a few general remarks. The directions as given, however, can easily be modified to suit any other particular piece of this class of work.

Make a frame 18″ x 24″, outside dimensions, 3″ deep. This frame is nailed together with a simple butt joint, having the corners reinforced with triangular blocks nailed into them, Fig. 12.

Almost any kind of wood will do for this frame, as birch or poplar or hard pine. A light stiff close-grained wood is preferable.

The webbing is placed and fastened as described on page 156 of the magazine above referred to, using only three strands across and two running lengthwise of the frame. Six springs are to be used, and the webbing should be placed so that the springs will stand exactly over the laps. There should be about 3″ between the outside edge of the frame and the row of springs. The webbing is $3\frac{1}{2}$″ wide, and No. 3 springs are about 5″ across. This suggests that the strands of webbing should be $3\frac{3}{4}$″ from the outside edge of the frame.

Put in six No. 3 springs, turning the bent ends up. If they stand perpendicularly they are ready for sewing; if they do not, pull the lower

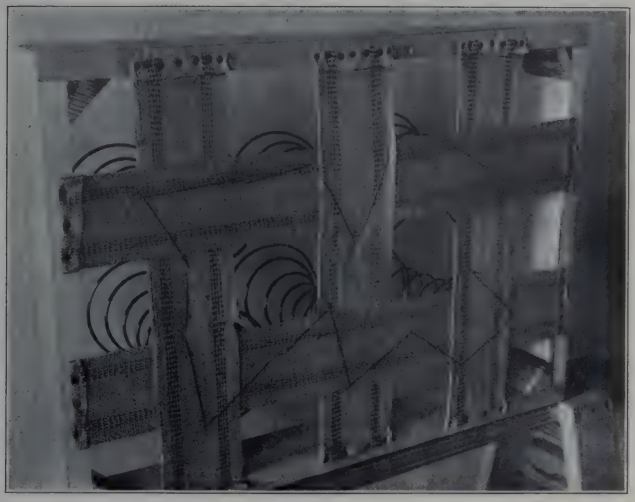


FIG. 13.

coil into such shape that they will stand upright. Sew the springs to the webbing with stitching twine, and a 6″ double-pointed needle. There should be at least three loops around the bottom coil of each spring, Fig. 13. Pull the twine tight, starting with the first stitch, and tie the last end to a near-by stitch.

We now come to a very important part of the work. The springs have to be tied with spring twine to keep them in an upright position and prevent breaking down and bending. This twine also supports the burlap and stuffing above it. The springs are tied down and this twine

should receive all the pull from the reaction. When a person gets up from sitting on the seat the springs come up with a push; the twine should then receive this strain. There are several more important duties that this twine has to perform, so it is important to have it of good quality and properly inserted. Upon the permanency of the webbing and spring twine depends the lasting qualities of the seat. It is usually the spring twine that gives out first, and next the webbing breaks down.

To make a lasting piece of work we shall tie the springs eight times; that is, use four twines across each spring, one from front to back, one from side to side, and two diagonals. Cut

Three twines 2 ft. 6″ long, for crosswise pieces.
Two twines 3 ft. 4″ long, for lengthwise pieces.
Four twines 3 ft. 4″ long, for diagonal pieces.
Four twines 2 ft. 3″ long, for diagonal pieces.

Multiply the dimension of the frame by about one and two-thirds to get the length of twine needed.

Tie a simple knot in one end of a 2 ft. 6″ twine. Drive a 10 oz. tack through it into the top edge of the frame so that it comes in line with the central part of the spring. Stretch it across the tops of the springs to the other side of the frame, and pull the springs down with it so the outer side of the coil is only 6″ from the bottom, and the inner side is 7″ high. Adjust the springs so that they stand vertical. Grasp the twine and spring nearest the fastened end with the thumb and forefinger of the left hand, holding the twine and spring together while, with the right hand, pass the free end of the twine down inside the coil, up on the left hand side of the fastened end, down inside the coil again, up on the right hand side of the fastened end, and through the loop of the twine thus formed. The advantage of this kind of knot is that it does not pull out even after the twine wears off. With the cheaper knot the whole string begins to loosen immediately after it is first worn off. A careful examination of Fig. 14 and a little practice will make clear the method of making the knot. Pull the twine taut to the other side of the coil and make another knot. This time, however, the twine is passed down the outside of the coal first and up on the inside. Before tying the second spring, pull the twine down as in the first place, which will locate the knot. When the second spring is tied drive a tack part way into this side of the frame, and wind the twine once and a quarter around it; pull it tight enough to bring the springs down properly, and drive the tack down tight. Take another

tack and drive it into the end of the twine close to the last tack. It is of importance to fasten the twine just this way so that when it moves up and down with the springs it will not wear against the head of the tack.

The other two 2 ft. 6″ twines are put on in just the same way. But when the twines are put on lengthwise and diagonally one must be very careful not to bring the springs down any lower or the first twines will be loose and there will be uneven strain and uneven wear. Adjust all twines in such a way that they come across the central part of the

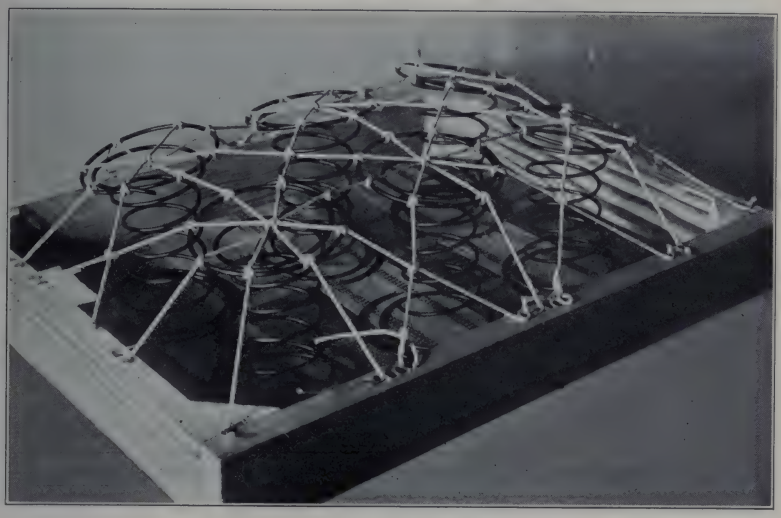


FIG. 14.

spring. The last twine that is passed across other twines should be tied to them at each crossing. This prevents the twines from wearing off across each other. Fig. 14 makes all these points clear.

A piece of 10 oz. or 12 oz. burlap is now tacked on the top edge of the frame. The burlap should be tacked with $3\frac{1}{2}$ oz. or 4 oz. tacks, folding the edges over as they are being tacked. Tack it just tight enough to become smooth but not so that the springs will be pulled down any more than they already are. As has been stated before, the pull from the springs should be all on the twine and not on any of the goods above it.

Sew the burlap to the springs with a curved needle and stitching twine. This keeps the burlap in one position and prevents wearing. It also helps to unify the seat.

The stuffing is now put on. Take 5 lbs. of tow, and pick and pull it out thoroly. It should be pulled out (not apart) until it becomes evenly fluffy all thru. Place it on the burlap and work it down and out so that it will project about 3″ beyond the frame in its free state. Fig. 15 shows the bare burlap on the right and the proper amount of tow on the left. Be sure to get an even amount of it on all four edges.

Place a piece of light burlap, 6 oz. or 8 oz., over this tow. It should be large enough to be slip-tacked down on the sides of the



FIG. 15.

frame. Stitch thru the two layers of burlap with a 12″ or 14″ double-pointed needle. The row of stitching should come just outside the edge of the springs. Each stitch should be about 3″ long and is formed by simply passing the needle up and down through the burlaps. When all four sides have been stitched the twine is pulled up tight by beginning at the first stitch and pulling up each stitch toward the last. Before the twine is fastened a few stitches may be taken around thru the central part of the seat. In this way it becomes very firm and compact. Be sure not to pass the twine around any of the loose coils of the springs in doing the above mentioned stitching.

The slip tacking is now released and the loose edges of burlap are rolled up under the tow. Drive tacks thru that part of the burlap that comes in contact with the top edge of the frame, beginning at the center of all four sides and working toward the corners. Use extra precaution to make all sides equal. The corners are tacked last and it is more than likely that they will be found too full where the double

folding of the burlap comes. You will have to both cut away burlap and take out tow to keep the corners even with the sides.

We now come to that part of the work from which this class of upholstery derives its name. The stitching of the rolled edge already formed is the most difficult part of this work when done well, and pains must be taken to do it well in order to produce a nice looking seat. Usually two rows of stitching are put into the edge all around, but sometimes three or four so that the edge becomes very thin and permanent. The first row is very different from the others.



FIG. 16.

Use a 6″ curved needle. Begin at the left hand end of one of the rolls. Start the needle into the roll about 3″ from the row of tacks, and have it come up and out about $1\frac{1}{2}$″ from the row of stitching. Pass it to the right about $1\frac{1}{2}$″ and pass it into the roll again about $\frac{3}{4}$″ from the row of stitching and allowing it to come out about $1\frac{1}{2}$″ from the row of tacks. Tie the end of the twine around the other with a double slip knot. Pass the needle toward the right about $1\frac{1}{2}$″ up thru the roll and down as before. Continue this around the four sides of the seat. The right hand needle in Fig. 16 shows this first row of stitching. Use the regulator, also illustrated in Fig. 16, very frequently to even up the roll. Be sure to insert the needle at right angles to the roll for the arc of the needle gathers in a lot of tow that is forced into the roll tighter when the twine is pulled tight enough to become straightened.



FIG. 17.

The second row of stitching is also illustrated in Fig. 16. The stitches are not taken in a zig zag manner as in the first row. The needle is inserted about $\frac{1}{2}''$ above the first row of stitching and allowed to come out the same distance on top. Instead of passing the needle to the



FIG. 18.

right as formerly, it is passed to the left about ¾″ and pushed down thru. The double slip knot is tied as before. Pass the needle toward the right about 2½″ and insert it as at first; then carry it back again about ¾″ and after pushing it part way thru the roll, the twine is wound around the point. See left hand needle in Fig. 16. When the second row of stitching has been carried around, more stuffing has to be put on top of the seat to fill out where the stitching has pulled the seat in. Hair used for this purpose would add life to the seat, or moss might be used. In our



FIG. 19.

project we use tow enough to even up all depressions and then put a layer of cotton batting over this. Then a piece of muslin, large enough to come down on the sides of the frame, is tacked over all. Fig. 17 shows where the muslin is partly tacked and the other parts rolled back. The muslin is kept smooth along the edge where it is tacked and also at the corners. Cut out part of the corners to attain this smoothness.

The cover should be a soft cover rather than leather or imitation leather. It is put on like the muslin, except that it is tacked under the bottom edge of the frame, and the folds are made to come straight down at the corners. Fig. 18 shows the left hand corner marked and partly cut The right hand corner shows the fold made and tacked underneath. The process of blind stitching is also shown. When all the corners are blind stitched tack a piece of cambric under the whole seat and the hard edge seat is complete. Fig. 19 shows the completed cricket.

ELECTRIC TOASTERS AND PLATES.

F. C. VINCENT.

OWING to local conditions in Everett, Washington, our electrical classes have the peculiar characteristic of being composed of boys of all ages and stages of advancement—from pre-vocational and trade with no education in physics, to the upper high school student, advanced in that subject. Only forty-five minutes each day can be

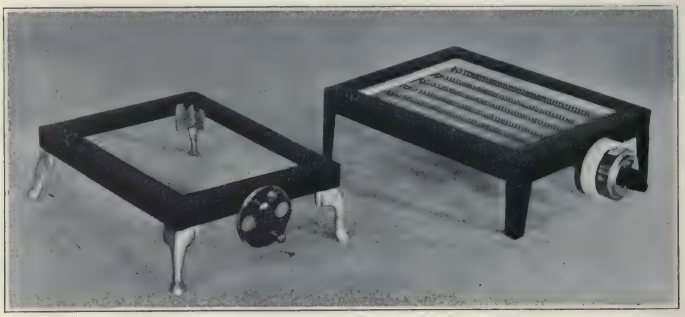


FIG. 1.

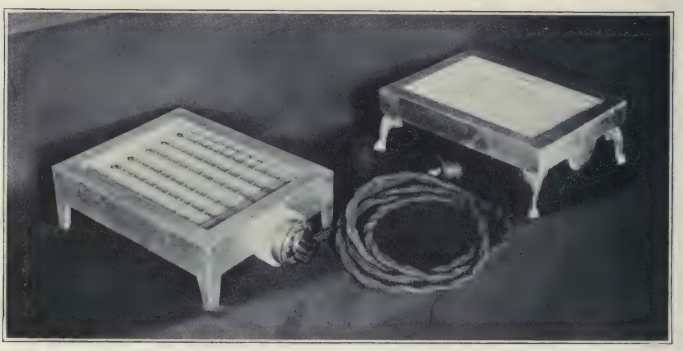


FIG. 2.

allotted to each class. It therefore becomes necessary to provide class-work in which all may be able to participate. In the field of heating appliances the boys have handled enthusiastically the toasters and the two-burner plates.

Consider, first, the toaster. Four patterns were developed. The simplest have iron only in the frame. The more elaborate have aluminum castings. See Figs. 1 and 2. Brief details are herein given for the construction of the simplest pattern. The more elaborate patterns may be developed as the shop's equipment permits. The frame is made of $\frac{3}{4}''$ x

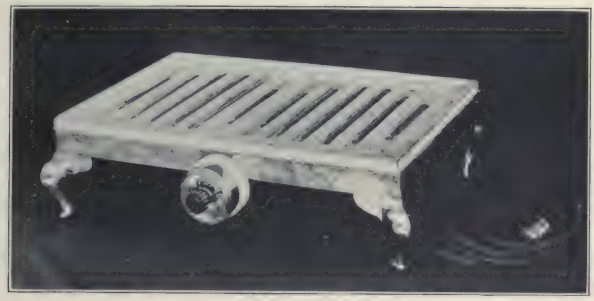


FIG. 3. TWO BURNER PLATE.

$\frac{3}{4}''$ x $\frac{1}{8}''$ angle iron, layed out, sawed with a hack-saw and filed as shown in Fig. 4. It is then carefully bent into its final shape. The legs are now made as shown in Fig. 5. Fit the leg to the inside of the frame and hold in a vise while a hole is drilled thru the side of the frame and leg. Countersink on the outside of the frame. Rivet and file flush with the surface. Secure the open corner to the leg in this same manner.

The insulation, on which the heating element is secured, is a piece of $\frac{1}{4}''$ asbestos board, known on the market as transite (made by Johns-Mansville Co., Milwaukee.) This is a hard substance and works up similar to well-seasoned maple with the exception that it is more brittle. It is sawed to a size corresponding to the inside of the frame. On top of this and beneath the top of the frame a strip of transite is placed on each side, the corners mitered. See Fig. 6.

If a switch is desired, use a snap switch which shows "Off" or "On." As the frame is narrow and only one screw thru the switch will enter it, it becomes necessary to provide some sort of backing for the switch. In some toasters discs of heavy (No. 14 gage) sheet iron, on others discs of $\frac{3}{16}''$ fiber, cut to the size of the switch, were used. Fiber is preferable to sheet iron because of its insulating qualities. Two No. 10 machine screws, one thru the switch, hold the disc in place. (Fig. 1.) The lower side of the switch can then be screwed to the disc. Clearance holes must be drilled thru the disc for the electric wires.

The heating element is made of twelve feet of No. 24 gage nichrome resistance wire (made by Driver-Harries Wire Co., Chicago). Cut this into six equal pieces. Make them into coils by winding on an 8d. finish nail. Space the transite as shown in Fig. 6 and drill clearance holes for No. 4 round head brass machine screws. Cut from thin brass scrap twelve washers not over $\frac{1}{4}''$ in diameter. Between the head of the screw and this washer the end of the resistance wire is wound. The



FIG. 4. DETAIL OF ANGLE IRON FOR FRAME.

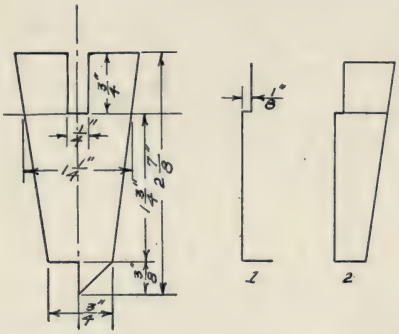


FIG. 5. PATTERN OF LEGS, NO. 20 GAGE BLACK IRON, AND STEPS IN BENDING LEG.

connecting links between the coils on the under side of the transite may be made from any thin scraps of brass or copper.

Asbestos covered heater cord should be used in preference to the ordinary drop cord. Separable plugs should be used in preference to inseparable ones. One wire of the heater cord is connected direct to the coils; the other to the switch. A short wire from the other side of the switch connects with the other end of the coils. To take the strain off the drop card at its fastenings, it is clamped tight against the back side of the disc behind the switch by means of a piece of heavy copper or brass screwed onto the disc.

The grid which protects the resistance wires and supports the toast is made up as shown in Fig. 7. This grid fits inside the top of the frame and rests on the strips of transite on the sides.

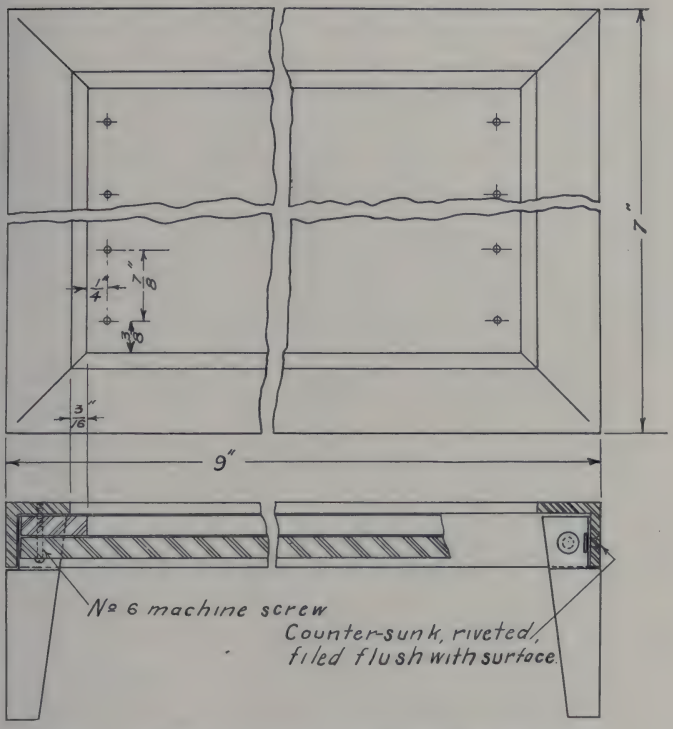


FIG. 6. ASSEMBLY DRAWING OF FRAME, LEGS AND TRANSITE.

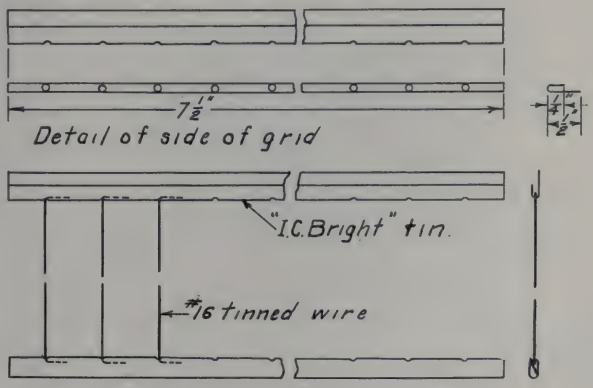


FIG. 7. STEPS IN ASSEMBLY OF GRID.

Give the iron work two coats of some good stove enamel and the toaster is ready for service.

Some of the boys had previous experience in the foundry. They made patterns and aluminum castings for their toasters as shown in Fig. 2.

The two-burner plate (Fig. 3) has a frame made of 1″ x 1″ x $\frac{1}{8}$″ angle iron polished and lacquered. It has a dead air space of $\frac{1}{4}$″ between two sheets of transite. Strips of transite, secured by screws between the coils, provide suitable support for cooking utensils. The two-circuit switch controls either or both burners.

It may be of interest to include an itemized list of costs for a toaster above described and as shown in Fig. 1, right.

Angle iron	$ .05
Legs (scrap)	
Transite	.15
Screws and rivets	.10
Nichrome wire	.07
Grid	.03
Heater cord (6 ft.)	.30
Switch	.25
Plug	.20
Total cost	$1.15

Market value $3.00 to $5.00.

The two-burner plates cost the boys $3.25. Their market value is from $10.00 to $12.00.



MADE BY STUDENT IN MANUAL ARTS HIGH SCHOOL, LOS ANGELES, CALIF.

THE ATTITUDE OF THE NATIONAL ASSOCIATION OF CORPORATION SCHOOLS.

CHARLES A. BENNETT.

THE organization and work of the National Association of Corporation Schools has been looked upon with interest by educators generally, and possibly with suspicion by some. From the corporation standpoint it was doubtless a most natural thing to have the teachers in this new type of school get together, compare methods, report on conditions, etc., etc. From the standpoint of public education it was natural to ask why this new national organization, representing the great business interests only, had come into being to study and take action upon the same problems that were being considered by the public schools. Was the new organization indicative of a lack of faith in the schools and a desire to be separate, or what?

Those who have followed the general trend of the meetings of this new organization must have become convinced that this group of men is not in opposition to the development of vocational training in public schools but that they do see what seem to them to be very definite limitations to the possibilities of effective vocational training in public schools and they seem to have reached the conclusion that notwithstanding all the development that the most sanguine can expect to take place in public education, there will still be need, within the larger and highly specialized industries, for the instruction of workmen. This instruction will be mutually profitable to both the corporation and the individual workman.

From this point of view, then, there is reason why schoolmen should learn from the corporation schools and, we may believe, there are certain details which the corporation schools may learn from the results of public school experience. There is every reason for cooperation between the public schools and the corporation schools.

Not the least important of the results that should come from such a cooperation would be the determining of the exact limitation of the work of each as related to the other. In a very able address before the convention of the National Association of Corporation Schools held in Worcester, Mass., last June, President Charles P. Steinmetz made a significant statement in this regard. In approaching this subject, however, he mentioned the changes wrought in industry thru the development

of the modern corporation, and the relation of the corporation to social welfare and education. He said:

While the corporation is proving the most powerful and most efficient tool of industrial progress, at the same time some defects have appeared, and have led to the present rather widespread antagonism against the corporation. Nevertheless, these defects are not inherent in the nature of the corporation, but are due to its newness and crudeness, which led us to overlook too much the human element in the industrial relations between corporation, employes and public.

In the small production of bygone days, personal relations existed between the individual employer and employe, which do not exist in the large corporations, and must be replaced by organized effort. That is, to the financial, administrative and engineering or manufacturing activity must be added a fourth activity, that dealing with the human relation of the corporation with its employs and the public at large, before the corporation can sociologically justify its existence.

The beginning hereof is seen in the so-called "welfare work," in attention to hygiene and safety, profit-sharing and service annuities, etc., and in the educational work of the corporation.

The most serious problem resulting from the corporate development of the industry is, however, the failure of the supply of skilled workingmen. In individualistic production, the apprentice or helper learned his trade from his employer, who was skilled in the trade. To some extent this is still the case in some trades.

But within the field of the modern corporation, with its subdivision and increasing specialization of work, very little chance existed for the young man to learn a trade and become a skilled workman.

Immigration from Europe for some time supplied skilled workmen. However, European countries have become industrial and retain their skilled men, and those who immigrate are directed to European colonies, so that the supply by immigration is vanishing, while the demand of our industries is increasing.

The trade apprenticeship courses of corporations and the industrial education of the public schools at first appear to be in competition with each other, but in reality the problem of the trade apprenticeship can be solved only by the cooperation of the corporation and the public school, as was proven by the experience in the professions.

Experience also has shown that the graduate of the engineering school is not an engineer, the graduate of the law school or medical school not a lawyer or physician, but merely prepared to enter the practical part of his professional education in the industry, the law office or the hospital.

Later in his address he referred to the field of the corporation school and its relation to the public schools as follows:

Applying the same to the trades we see that the practical trade training must be given in the industry, by the corporation apprentice course, but the public schools must do the preparatory work.

The field of the corporation school is the industrial training of those fitted for the industry. The field of the public schools is the general education, that is,

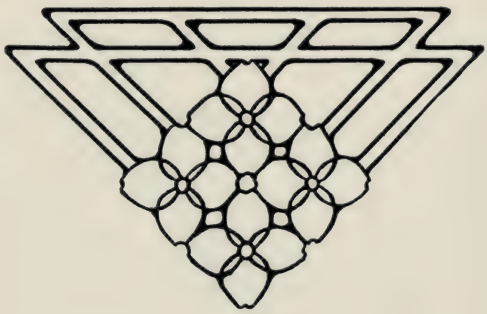
to supply that minimum amount of knowledge which every intelligent citizen must have before he can specialize in trade or profession, or at least that part of general education which is difficult to acquire afterward.

It is signficant that today practically all scientific research, most of the inventive and development work is done within the industrial corporations or the educational institutions, and very little by the unattached individual, showing that in the corporation is found also the most efficient means of making individual development possible in our present state of civilization."

Such a statement from Dr. Steinmetz is sure to stimulate thinking on the part of schoolmen. Moreover, the recent action taken by a conference of committees representing both the organized employers and the organized workmen in the printing industry, reported in the October issue of this Magazine, bears out this statement of Dr. Steinmetz' with reference to the necessity of giving instruction within the walls of the industrial establishment. By some who are antagonistic to vocational education, the statement by Dr. Steinmetz will be eagerly grasped as proof of their contention that strictly vocational training is not the function of the public schools. By others it will be used to prove that continuation schools and part-time schools only are needed to meet vocational demands. Others will see in "the preparatory work," which Dr. Steinmetz says belongs to the public schools, the great field for general industrial training which they are seeking to enrich with manual arts subjects and correlated industrial studies. Still others will point out that the corporation schools, in the nature of things, can teach only their own employes, and that there are more industrial workers in small industries than there are in the great corporations, that the smaller industrial units cannot as individuals provide schools for their workers, and up to the present time they have not often combined for this end. If they were to combine the result would be, in essential educational elements, almost identical with what the public schools are now trying to provide.

We think it ought to be clear that even with the corporation school developed to its greatest extent and to its highest efficiency there will still be a strong demand for vocational training by those who are not and cannot be employed by great corporations, and this will be by far the greater number. This vocational training may not be of quite the same highly specialized nature as that found in the corporation schools, but all the better for that, if it is just as thoro and just as much in harmony with modern methods of doing work in small industries as the corporation school instruction is in harmony with methods in corporations. While it is true that this is an age of great industries and highly specialized factory methods, the nation is still in need of all-round me-

chanics. Indeed it would seem that in spite of all the development of industrial schools of various sorts we are not half keeping up with the demand for mechanical knowledge and skill which is coming with the automobile, the farm tractor, and the mechanical conveniences of the modern home whether that be urban or rural. Surely there is a place for the school that will train the all-round mechanic as well as for the school that trains a corporation specialist, and the former is well within the field of public education.



EDITORIAL COMMENT

IN our last issue we called attention to the importance of school advertising, and by giving the advertising methods of several schools, suggested how it may be made effective. Another instance of such advertising has just come to our attention. In October the Vocational School of Springfield, Massachusetts, held a ten-days exhibition of its work in printing. The exhibit was visited by some of the foremost printers in that section of the country, as well as by a goodly number of people usually classified as "the general public." As was doubtless expected, the printers were pleased. This fact is of vital importance in building up public sentiment. If the recognized experts in any line of industry approve of their line of work in a vocational school it is usually safe to conclude that the rest of the community will approve of it. The exhibition was so successful that it is now proposed to hold similar exhibitions of other departments of the school.

THE state superintendent of public instruction in Connecticut has pointed out that there are 80,000 boys and girls in that state over 14 years of age, and that there are only 16,000 of these in the various schools of the state. This leaves about 64,000 children getting no more than a grammar school education. He is using these figures to argue for the establishment of trade schools, which will reduce these figures. Comparing the trade school with the high school, he says: "It gives them a better start in life, as a boy without some special training is at a disadvantage."

The trade school certainly gives a better start. Whether it gives a better finish has often been doubted; but the big fact remains that the trade school catches hundreds who would never go to a high school, and gives them what is essentially an equivalent education, and for them a better education. We need more of the type of vocational school which superintendent Hine has in mind.

MASSACHUSETTS has done another fine thing in the interests of education by establishing university extension work under state direction. The work will combine the advantages of class instruction in part, with some of those of correspondence teaching. When, as a result of advertising, a number of persons, approximately six, are found who desire the same course, provision is made whereby these shall receive the correspondence leaflets and directions, with the under-

standing that they will meet together at least once a week, and that their instructor will visit them perhaps once a month.

Professor James Ambrose Moyer, Head of the Department of Mechanical Engineering of The Pennsylvania State College, has been appointed director of this new department. Professor Moyer will have $50,000 at his disposal for the first year.

"THINK what the Gary system will mean to my department. Now we have only one hour a week for art and one hour for manual training, or in some grades, an hour and a half. But in the Gary plan schools will have an hour daily for each of these topics. Imagine what may be accomplished by such intensive training." Thus Hugo Froehlich is quoted with reference to the introduction of the Gary plan into two of the schools of Newark, New Jersey. "Intensive training?" Yes, but no more intensive than the training in the traditional school subjects. Art and manual training have proven that they deserve equal recognition with other school subjects.

Not only will the pupils in these two schools go further in the shopwork and drawing subjects now in the schools, but mechanical drawing and probably electricity and printing will be added. And thru it all will be the art-industrial spirit which has been developing in Newark during the past two years since Mr. Froehlich has unified manual training, cooking, sewing, and art as the manual arts department of the public school work.

OPERATION OF THE NEW LAW IN IOWA.

ONE effect of the new law in Iowa has been to force into the teaching of manual training, home economics and agriculture many teachers who are not reasonably well prepared to teach these subjects. They have only a "first aid" knowledge, and perhaps some of them not even that. The law requires that all schools provide instruction in these subjects, but the superintendent of public instruction has felt obliged to warn the county superintendents against some of the more notable causes for failure. In a recent letter State Superintendent Deyoe enumerated the causes for failure in teaching agriculture as follows:

> Teaching text book agriculture only; teaching subjects which have no application to their localities; season sequence is not followed; no field trips are taken; no experimental work is undertaken.

The law requires that the school boards furnish proper equipment for such teaching, yet some of the schoolrooms are so small that space seems lacking for even an oil stove and a domestic science cabinet.

For these and perhaps for other reasons also, the state superintendent has advised that cooking be taught in selected schools only, while sewing is taught in every school. Concerning woodworking he advises that not all schools start at once.

Whatever may be said of the wisdom of passing such a law as Iowa now has on her statute books the present situation demands that she take every available means of organizing the manual arts and practical science subjects so that they can be successfully taught in the small schools at the least expense, and of gradually training the teachers to the point of giving effective instruction. Perhaps some of the counties in Iowa could get suggestions from the cooperative supervision scheme first worked out by Professor C. S. Van Deusen in a group of schools in Peoria County, Illinois, and now in successful operation in northern Ohio, with the Kent State Normal School as a center. If the schoolmen of Iowa can solve this problem which has been thrust upon them they will be leading where others will be glad to follow.

WHERE SHOULD COOPERATION END?

"I am a resident of Prospertown. I am the owner of its leading drygoods and department store. I am interested in the growth of the commercial and industrial institutions in the city because such growth helps my business. But I am also interested in the character of the city's growth. I want to see others prosperous as well as myself, not merely because prosperous people buy goods, but because I am not wholly selfish; I can lay claim to having some love for my neighbor. I am therefore interested in vocational education, first, because it will make my employes more efficient and, second, because it will help them up in the scale of living. I am in favor of vocational education for my employes even if I have to pay for it, but I do not think I ought to pay for it—certainly not for all of it, because I am not the only one benefitted, and because I live in a country where education is a function of the State. When I need an efficient lawyer the State educates him at great expense. When my neighbor, a manufacturer, needs an engineer the State trains him for service. If I want a superintendent for my stock farm I find him among the graduates of the University. But if I want an expert salesman for my silk counter I must educate him myself,

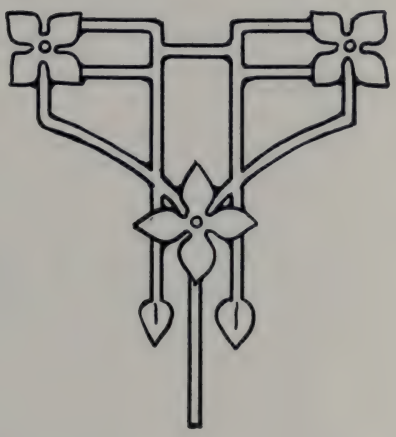
so far as any help from the State is concerned. If I were the only one benefitted I would employ a teacher of salesmanship and make no complaint. But my salesman is greatly benefitted and sometimes my competitor also, for I cannot prevent all the men I train from accepting offers to work in other stores. Under these circumstances I think the State should at least cooperate with me in this work. This is the State's work as much as training my farm superintendent or my lawyer."

This is about the way many business men look upon vocational education. They want vocational education, but it must be real vocational education; it must give vocational results by efficiency test. And "there is where the shoe pinches" at the present time. Just how shall a school be organized to give the required results? Shall it be in the public school, or in the store or factory, or shall it be partly in both school and factory?

An interesting address bearing on this vital question was delivered by Edward A. Filene, the owner of one of Boston's leading department stores, at the recent meeting of the New England Association of Colleges and Preparatory Schools. Mr. Filene was reported as saying:

> For any adequate dealing with the matter we must use as schoolrooms all the places where boys and girls, or men and women spend their workaday lives. Every factory and shop must become a school. That this idea is not visionary is shown by the fact that many factories and shops have already become schoolrooms, and becomes so much to the profit of their owners as well as that of the employes.
>
> A big store in one large city, for instance, began teaching salesmanship with the help of the executives. This they followed up by training teachers for the public schools and enlarging the courses they were giving in their own business. This year the city has hired rooms in that store and is teaching classes there at its own expense—classes made up of employes of that store and the stores of competitors. To this are added their own classes for employes in such studies as languages, singing, physical training and so forth.
>
> Many factories in America also have schools, and we have learned much in this respect from some of the European countries. If trained educators of the nation, such as I am addressing here tonight, will consider this matter, they will find that a one hundred million dollar plant immediately for education in Massachusetts is not so visionary as it must have seemed on first hearing, because this plant is already in existence in shops and factories to a value far greater than the sum I have mentioned. What is more, the selfish as well as the finer instincts of the owners of these shops and factories will efficiently supply the motive power for the use of this vast plant as an educational school when once the educational experts and the leaders in public life of the type that you represent here will make them see the great need and the great possibilities that lie ready at hand in the shops and factories to meet the need.

Coming from Mr. Filene, who knows schools as well as stores, and whose high motives are not questioned, this statement has special significance. Can it be true that a hundred thousand dollars a year of public money would bring better results if spent in maintaining schools in stores and factories scattered about the city than in maintaining one great central school of technical training, or several smaller schools in public buildings? Can store proprietors and factory owners generally be depended upon to keep up their end of such a cooperative scheme? Will teachers do their part? Is it really practical or only visionary?



OF CURRENT INTEREST

TWO SCHOOL BOARD PROBLEMS.

Under this title the vocational section of the Curtis Publishing Company, Philadelphia, has issued a circular letter which is of special interest to school people as emphasizing a significant trend in the educational activities of a large corporation. The circular is addressed to members of school boards, and has been widely distributed over the country. The two "problems" of the school board to which attention is directed are: (1) keeping boys longer in school; (2) preparing them for life.

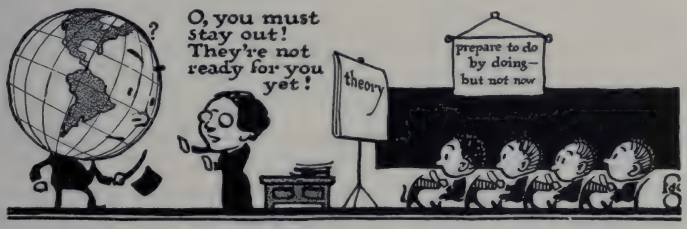
For a number of years the Company has been developing a sales organization for the marketing of its three publications, which organization at the present time includes over fifty thousand boys—schoolboys, for the most part. A sense of responsibility toward these boys has been developing also, which has derived its stimulus apparently from two principal sources: (1) the boy on the street corner who sells the magazines, like the salesgirl in the department store, is the representative to the buying public of the Company, its business ideals and methods, as well as wares; it is important that the Company be well represented; (2) after a few years of work with the Company most of the sales boys are obliged to seek other and more remunerative employment; it is importent that experience with the Company shall lead to something worth while, else the supply of capable boys will ultimately fail.

In the attempt to meet its responsibility in these directions the Company has perfected a "cooperative free course in salesmanship," which supplements the studies pursued in school. The plan is outlined in the circular referred to.

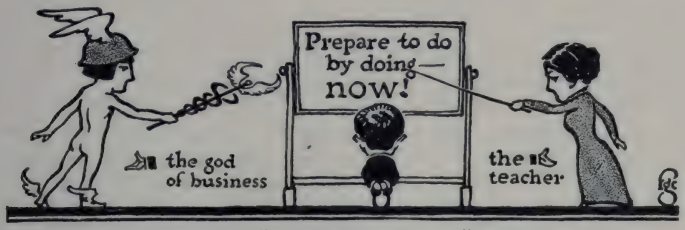
> Our more proficient boy agents become members of the League of Curtis Salesmen. This is an honorary organization to which are admitted (1) only boys boys who maintain a fixed standard of excellence in private or public school work, as well as in selling the Curtis publications, and (2) only boys who also possess fundamental qualifications required by every employer: honesty, industry, reliability, perseverance, courtesy, endurance.
>
> We frequently communicate with the boys' parents and teachers, who write us intimately about the boys' ambitions and inclinations. Our two thousand district agents, who supply our publications to the boys, are in close weekly contact with them. Each district agent is visited once a month by one of our fifty salaried superintendents of agencies. Our sales organization is such that we

have the intimate, personal knowledge of the boys' tendencies and desires which is essential for right guidance. We know what the more proficient are fitted for, and what they are interested in. We can intelligently recommend to employers boys who are qualified for positions in one department or another.

Of League members, those of greater enterprise and ability are promoted to the rank of "Expert Salesman," only after a probationary period of at least one year.



THE "BOW AND ARROW" METHOD OF PREPARING FOR LIFE.



THE MODERN "42 CENTIMETER GUN" METHOD.
(By permission of Curtis Publishing Co.)

From the "Expert Salesmen," boys who are exceptionally proficient both in school and in selling our publications are promoted to the rank of "Master Salesman," only after a probationary period of at least two years.

Eventually the time comes when these "Master Salesmen" leave school and discontinue selling for us—when we can no longer induce them to continue in school and at selling our publications. These boys, and they only, have our unconditional guarantee to obtain for them upon request by parents or guardians, good salaried positions with dependable employers. Hundreds of the largest firms and corporations in the country, including, for example, the Equitable Life Insurance Company, the Southern Pacific Railroad, the John B. Stetson Company, have asked us to refer to them our "Master Salesmen," who are ready to enter upon their life work.

The interesting point about the plan is that it has passed the experimental stage, and cooperation with school boards and with business

concerns is not a theory but an assured fact. Copies of the circular, from which two striking ilustrations are reproduced herewith, may be obtained upon application to M. E. Douglas, manager sales division, Curtis Publishing Co., Philadelphia.

THE PRE-VOCATIONAL SCHOOL IN NEW BRITAIN.

The following brief account of the organization and work of the pre-vocational school at New Britain, Connecticut, has been received from William L. Hagen, instructor of drafting, and vocational adviser in that school.

Six years ago the time given to and the content of the manual training activities of the New Britain grammar grades were very much like that of the average manual training course throughout the county. At that time, however, the old uniform course of study was discarded and we began to serve our courses "a la carte" with a menu adapted to children who have varied interests, varied capacities and varied desires.

Upon reaching the seventh grade the boys and girls are given an opportunity to elect one of the following courses: (a) general course; (b) business and English course—both courses open to boys and girls; (c) practical arts course for boys, household arts course for girls. The choice of courses is not left to the pupil alone, but is in all cases subject to the approval of parents and school principal, and during the last year, to the recommendations of the vocational advisor also. The same is true with requests for changing from one course to another.

Among the many interesting observations proving the practicability of this plan of differentiated courses can be mentioned an increase in grammar school attendance, an increased average age, a decrease in the number of withdrawals from school, economy in time and effort, and more rapid progress due to bringing together children with common interests and aptitudes.

The practical arts course was designed to serve as a concrete agency for vocational guidance to boys who are mechanically inclined. Up to a year ago the weekly schedule of the boys electing this course included, besides three hours of shopwork, two hours and forty minutes a week of industrial arithmetic and mechanical drawing taught by the shop men. Our shop equipment consisted of woodworking benches and tools, a fairly good outfit for painting and one for brass and copper work. With this equipment a great deal of work in the way of interior finishing, construction and equipment for school buildings was done. The following is a partial list of work done in the last three years, illustrating the nature and extent of this "community work."

Built a drawer cabinet and cupboard in a domestic science room.

Sized walls and ceiling, and painted with two coats the walls, ceiling and woodwork in one classroom.

Refinished oak top of office table and desk.

Graded and marked out a tennis court for the Teachers Club.

Built 34 sand tables for geography work.

Built 1200 wooden looms for weaving in primary grades.

Built 24 basket ball stops and 10 jumping standards for physical training work.

Made 8 May poles for a play festival.

Sheathed the grammar school gymnasium, including the construction of wall-pockets for wands, dump-bells, Indian clubs, etc., and staining, shellacking and varnishing.

Repairing and painting picket fence around school yard.

Scraping and painting fire escapes and wire gratings on 52 basement windows.

Fitting up a workshop in a school, including laying 1200 feet of flooring, building partitions, work-benches, tool-racks, lumber racks, saw horses, etc.

Among numerous lesser undertakings may be mentioned: building 3 work-benches for the Boys' Club, a victrola stand for a parents' and teachers' association, an oak hall tree and umbrella rack for the office of the principal of the grammar school, numerous frames for pictures for schoolroom decoration, science apparatus, science cabinets, music cabinets, bulletin boards, window boxes, blackboard rulers, folding screens, kindergarten tables, taborets, boxes, trays, flag holders, book-racks, etc.

We have been unable to escape the conviction that in an industrial community such as ours, we owe to our mechanics of tomorrow an opportunity to develop some industrial intelligence and adaptability, if not specific skill. Thus the "community work" idea grew, and it became more and more the aim of the superintendent as well as of the instructors in the department of industrial training to furnish active participation in a variety of practical activities. But our plant was crowded and the equipment limited. Added school accommodations became an imperative need and the pre-vocational school, cuts of which appeared in the May issue of this magazine, was built. As far as we know, it is the first building in the country planned and built for the specific purpose of pre-vocational work. The school has now been in operation one year. Its organization is briefly as follows:

For the boys there are six shops—a drafting room, an electrical laboratory, woodworking, printing, machine and repair shop. These last four are all well equipped with the necessary power-driven machines. The boys spend three half days (nine hours) a week in the shop. They rotate from one to the other in the course of the year with six weeks of continuous experience in each shop.

At this writing a group of boys from the repair shop is at work erecting a 70 foot bicycle shed; another group from the woodworking room is installing counters for a bank and store to be operated by the pupils in the business and English course. Fifteen typewriter tables were recently delivered. Plans for these projects were furnished by the drafting department.

The machine shop has just finished making a 14-inch sensitive drill press to be used in the new vocational high school now in course of construction.

The boys in the electrical shop are at work installing a base plug and wiring for a stereopticon lantern.

The printers are, among other things, at work on an illustrated booklet describing the school.

The girls in the household art course also get nine hours a week of practical work—three hours sewing, three drawing, art structure and "novelty shop" experience, and three hours domestic science. The articles made in the sewing class consist largely of garments to be used by the pupils or their families. The domestic science includes cooking, housewifery, laundry, marketing, etc. A model apartment furnishes practical training in the care of a home. In the "novelty shop" they are just now at work on portfolios for the grammar school, and busy-work boxes for the lower grades. Studies of color harmony and space arrangement as applied to everyday life are pursued in the drawing class.

This school is not a trade school, but is designed to give in the most practical form guidance and assistance in choosing a vocation. In the words of the superintendent of schools, "its primary purpose is to supplement the general education of a grammar school course with short courses of practical work in a variety of industrial lines giving the opportunity for type experiences which shall enable the pupil to find himself—to discover his own aptitudes and to more intelligently and wisely choose a particular line of industrial work in which he desires to take an apprenticeship or trade school course."

SHEET-METAL WORK IN SPOKANE, WASHINGTON.

In the city of Spokane there is an ungraded school known as the Field School which takes care of the misfits and over-age boys. In this school the pupils are given a variety of manual arts work, including mechanical drawing, carpentry, cabinet making, wood-turning, cement work, cobbling and sheet-metal work. The classes are small in order to meet the special needs of individual boys; there is no class instruction at all.

The accompanying photographs show a corner of the sheet-metal equipment and some of the work done by the boys. The following statement is by Howard Russell, instructor in charge of this work.

Sheet-metal work as conducted in the Field School, Spokane, Wash., begins with some simple work in tin, making small utensils such as cooky cutters, biscuit cutters, match boxes, egg testers, funnels, cups, etc. This is followed by more difficult work with heaver materials, including most of the galvanized iron buckets used by the school district, as well as the large dust buckets used by the janitors, and the large garbage cans placed about the buildings and ground.

The equipment is not elaborate and does not require much floor space. The work is done on a long bench built along one end of the shop, and one large flat-top bench, as shown in the illustration.





TWO VIEWS OF SHEET-METAL SHOP, FIELD SCHOOL, SPOKANE, WASHINGTON.

The tool equipment consists of one 30″ bar folder, one 30″ stovepipe former, one large turning machine, one small burring machine, one hollow mandrel, one blowhorn stake, one square stake, several pieces of pipe of various sizes used for stakes, one Clayton fire pot, one pair of soldering irons, four pairs of Buffalo snips, three groovers, three rivet sets, three wing dividers, six scratch awls, six mallets, one hand crimper, one wire cutter, one pair of pliers, one hack saw, one large hollow punch, two small solid punches, two cold chisels one steel square and one machinists vise.



WORK DONE IN SHEET-METAL AT FIELD SCHOOL, SPOKANE, WASHINGTON.

The materials used are tin, black iron, galvanized iron, copper, brass, wire, rivets, kettle-ears and sundries as required for the various aticles to be made.

The boys made considerable use of this equipment in repairing numerous articles brought from home. It is a common occurrence for a boy to bring a wash-boiler, tub or bucket to be repaired. They show a growing interest in the metalwork and acquire considerable skill in the use of the various machines as well as in the use of the hand tools, and are able to make some creditable articles.

Some mechanical drawing is taught in connection with this work with direct application to pattern development.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

SOME PROBLEMS IN STEAM. III.[1]

COMPETITION NO. 2.

To stimulate an interest in metalwork, especially in elementary problems, the editors announce a competition to close February 1, 1916. *The first prize will be* $10; *the second* $5; *the third* $2.50; *and honorable mention prizes of* $1 *each for worthy designs.*

Remember that the bird house competition announced in the last issue closes December 20th.

The two engines illustrated and described in this installment are of the reciprocating type with single action, single cylinders. They were chosen as appropriate models for the grade in which they were made because elimination of the double cylinder avoids the difficult problems of stuffing boxes, cylinder heads, cross-heads and cross-head guides.

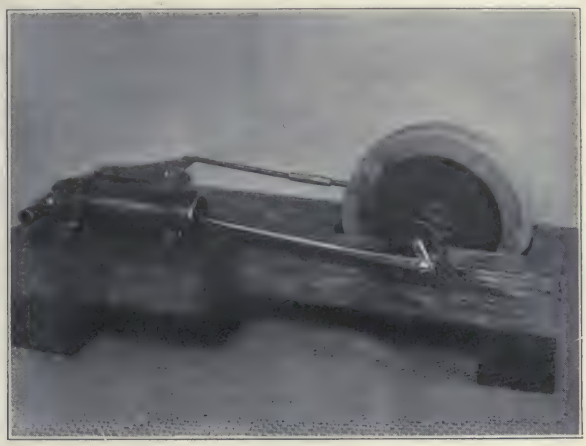


FIG. 1.

Both machines are mounted on wooden bases and have some details made of wood, which should be hard and well seasoned. Oak, birch or maple are preferable. The construction of these wooden parts is apparent from the drawings and needs no further discussion. All of them should be finished with one coat of shellac and two coats of good waterproof varnish. "Valspar" is recommended for this purpose as it will stand hot water and steam.

[1]The first two numbers of this series may be found in the March and April issues of Vol. XVI of this magazine.

The engine shown in Figs. 1, 2, 3, is a horizontal adaptation of the Westinghouse engine used to run the large ventilating fan in the local high school. It was due to the study of this engine by 8th grade classes that the construction of the first engines of this type were undertaken.

The cylinder is a piece of ¾″, inside diameter, brass pipe, one end of which has been closed by means of a head made of solder. To do this job a wooden plug made of dowel rod is fitted into the pipe to within ⅜″ of the end. After scouring and sand papering the brass wherever it is to come in contact with the solder, and treating it with a flux, the solder is poured in place. It was discovered that this operation is easier and the head much more substantial if small holes are bored thru the pipe and the solder allowed to run into them, thus holding the head in place mechanically. A piece of paper wrapped securely around the outside of the cylinder and tied in place will prevent the solder from running farther than it should thru these holes.

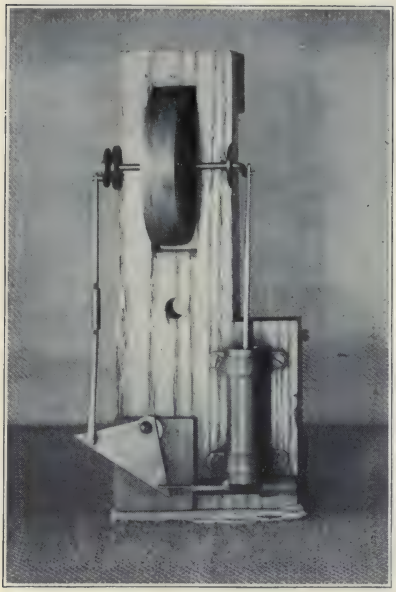
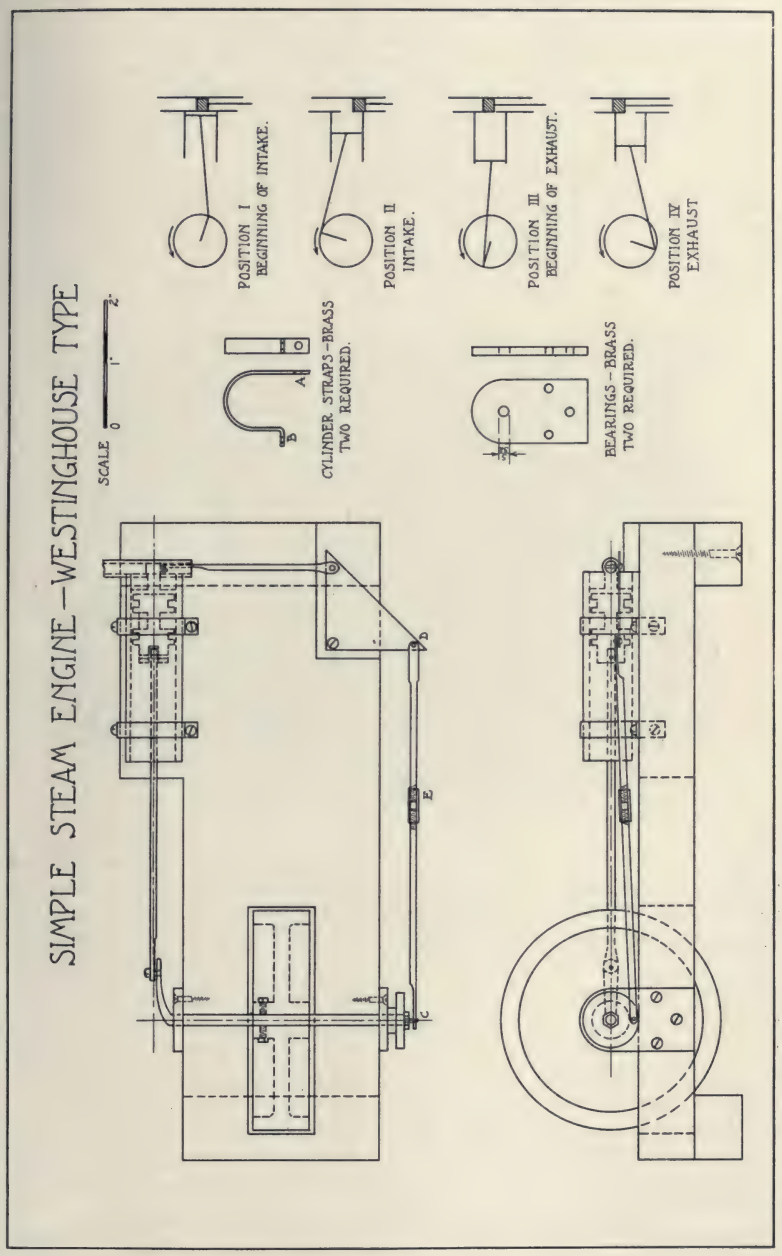


FIG. 2. A TOP VIEW.

In fitting the valve chamber, a piece of ¼″ inside diameter brass tubing is used. To the back of the cylinder a semicircular groove is filed across the end of the same with a rat-tail file. A $\frac{3}{16}$″ hole is then bored in the head of the cylinder and thru one wall of the ¼″ tubing. These parts are then soldered together with a soldering iron, care being taken to keep the holes in the cylinder head and valve chamber in line during this operation. This is accomplished by means of a $\frac{3}{16}$″ dowel placed in the cylinder and thru the hole in its head into the valve chamber. The two brass straps shown in detail, clamp the cylinder to the base. In attaching these straps the screws at A are put in place first, allowing about ⅛″ between the hook at B and the base. The second screw will draw the cylinder down securely on its foundation.

The piston is cast of solder in an extra piece of pipe reserved for that purpose. The operation is the same as that for making the head of the cylinder, except that 1″ in length is allowed for the piston and the inside of the brass pipe is coated with soot from a candle flame to prevent the solder from sticking. After pushing the piston out of the pipe it can be eased up with sandpaper until it fits the cylinder. The grooves for packing are made with a file while the groove cut across one end of the piston to fit the connecting rod is made with three hack saw blades put into the frame side by side to get the proper width.

The connecting rod is made of $\frac{5}{32}$″ diameter brass, flattened at both ends. This drawing out can be done cold if a little care is taken. One end of the


SIMPLE STEAM ENGINE—WESTINGHOUSE TYPE
SCALE
POSITION I
BEGINNING OF INTAKE.
POSITION II
INTAKE.
POSITION III
BEGINNING OF EXHAUST.
POSITION IV
EXHAUST
CYLINDER STRAPS—BRASS
TWO REQUIRED.
BEARINGS—BRASS
TWO REQUIRED.

connecting rod is drilled for a $\frac{1}{16}$″ pin to fasten it to the piston while the other end is prepared for the crank pin, a ⅛″ R. H. machine screw.

The main shaft of the engine, $\frac{3}{16}$″ diameter brass, is bent at one end, as shown, to form the crank. This is done in a vise and the surface where the crank pin fits is then filed flat. The other end of the shaft is then threaded for two nuts between which the secondary shaft of Russia iron, which feeds the valve, is tightened. The triangular rocker arm is made of 18 gage brass.

Only a brief description is necessary concerning the gear which feeds the valve. The joints at C and D are loosely fitted. The nut at E will make it possible to cause any delicate adjustment of the valve. This nut is made of ¼″ hexagonal brass drilled and threaded.

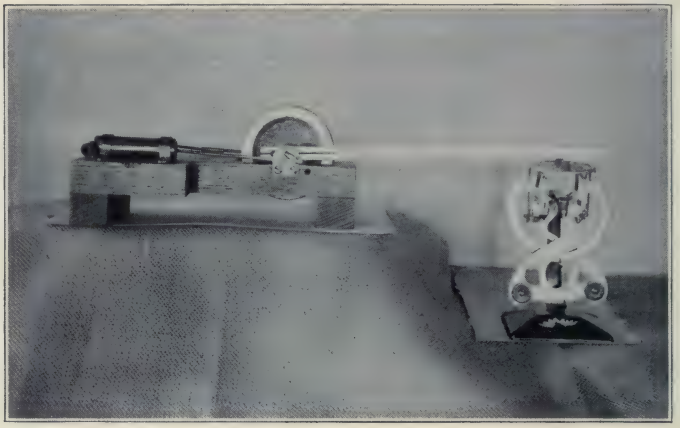


FIG. 3. ENGINE FITTED WITH PRONY BRAKE.

The fly wheel can be made of hard wood loaded with lead inserts as in the walking-beam model or cast of lead as shown in the illustrations. The latter method gives a little actual experience in foundry work. Split patterns, flasks, vent wires, risers, gate cutters and ramming tools were made by the class.

The small sketches at the right of the drawing show the position of the valve in relation to the crank at four points in one revolution. The eccentric must be set at right angles to the crank and so that the steam is just beginning to enter at Position I, and just beginning to exhaust at Position III. The throw of the eccentric should be one-half of the valve travel. Loosen the eccentric and revolve it 180° if the engine is to run backward.

Since it is impossible to see from the outside when the valve is in the positions shown in the sketches, the following method of determining these facts is used: After the details have been completed and the engine assembled as shown in the drawing, the crank pin is loosened and the piston is taken out of the cylinder. Now by blowing in at the open end of the valve chamber it is possible to determine whether the valve is just beginning to open when the crank is in

Position I. Adjustment to bring this about is made by turning the nut E. To determine that the valve is just beginning to exhaust when in Position III, put the lips over the open end of the cylinder and apply the pressure of the breath.

The leading sizes of this engine are as follows: Length of stroke, 1½″; diameter of cylinder ¾″; valve ¼″ diameter; valve $\frac{3}{16}$″ + in length; valve travel ⅜″.

Fig. 3 shows this engine rigged up with a prony brake to test its horse power. The scale is one such as is used in office work for weighing letters, and indicates ounces and fractions of an ounce. The engine is run at full speed, 1200 R.P.M., and then slowed down to 800 R.P.M. by means of the battery bolt and nut shown in the photograph about half way between the rim and center

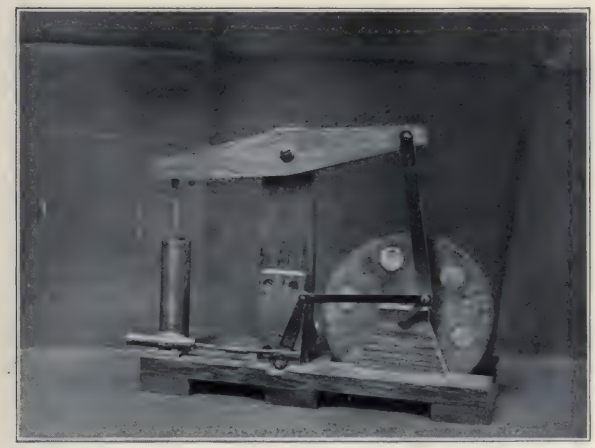


FIG. 4.

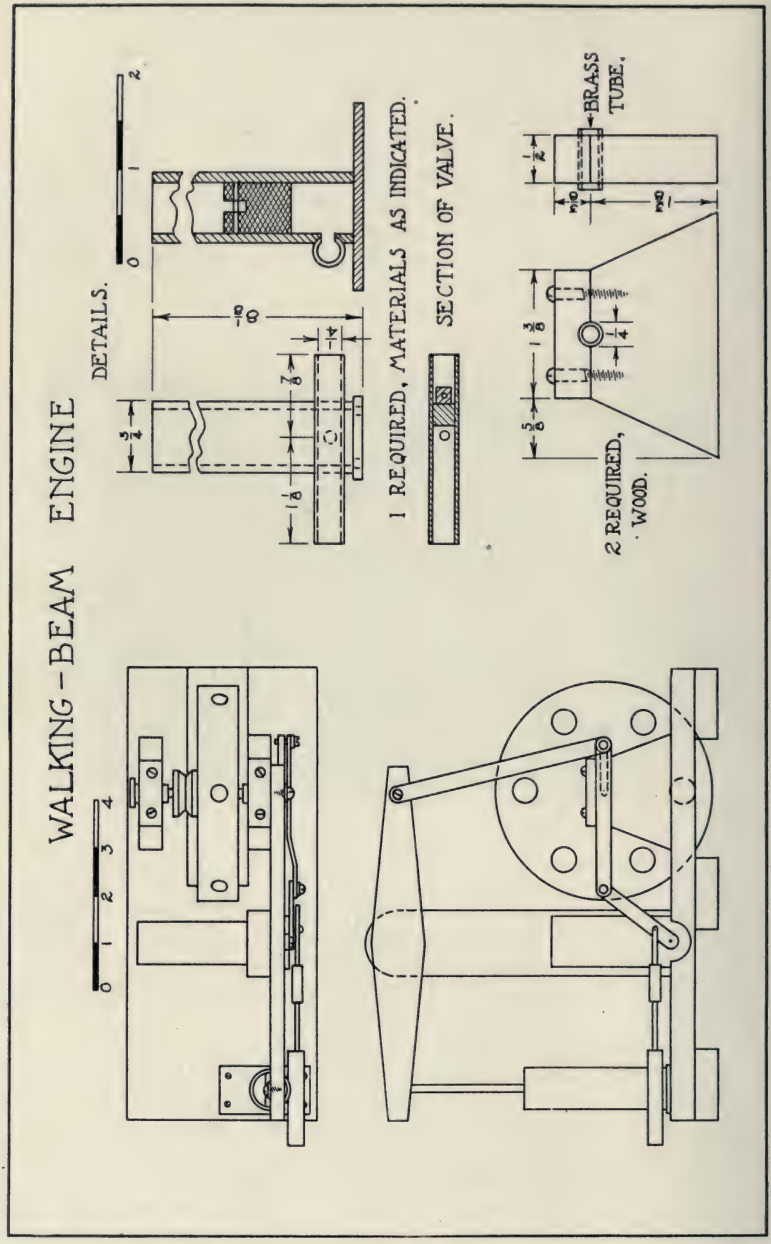
of the fly wheel. This mechanism increases the pressure between the two parts of the arm, and therefor the friction on the shaft. At the reduced speed the rod pushed the scale down until it registered ¾ oz., the downward pressure on the scale being exerted at a point 10″ from the center of the shaft. The following calculation gives the resulting horse power:

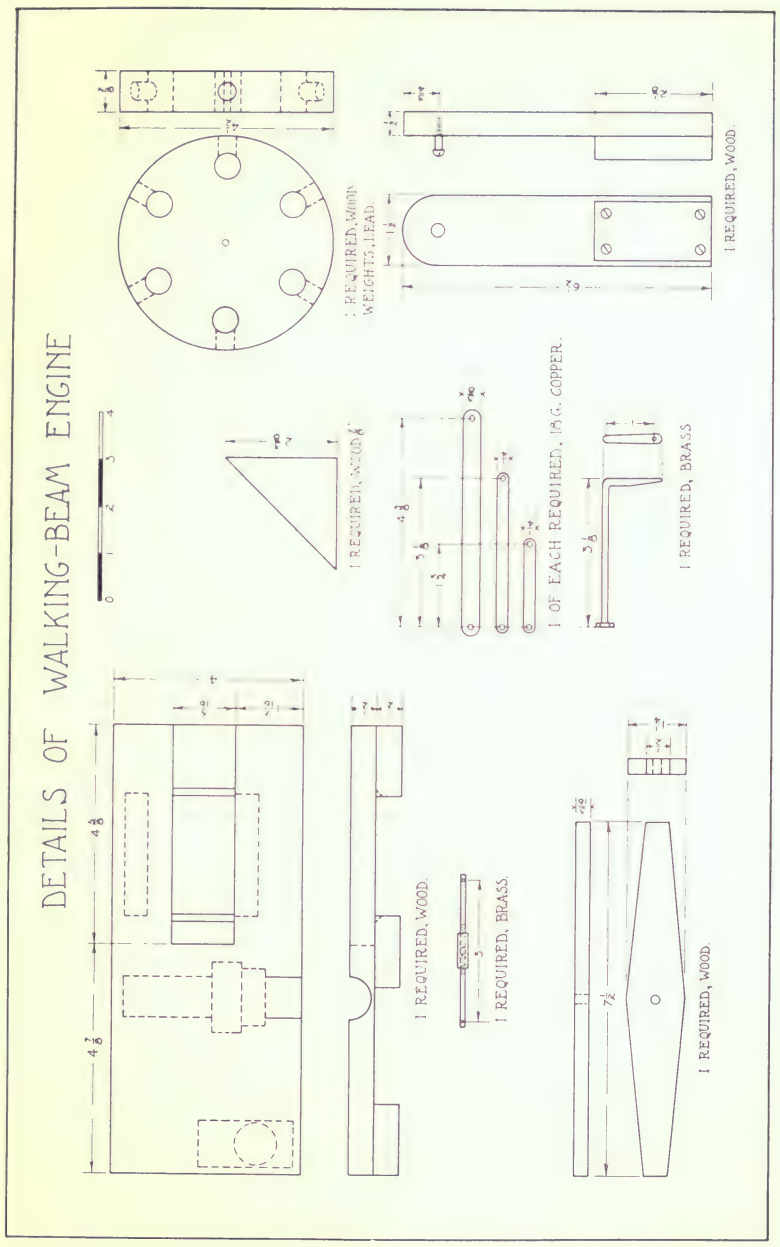
H. P.=Foot pounds per min.÷33,000

H. P.=circ. of circle in feet×R.P.M.×force exerted in pounds÷33,000

H. P.=(2×10×3.1416×800×¾)÷(12×33,000×16)=.0059+

The walking beam engine shown in Fig. 4 and in the assembly and detail drawings is constructed in its detail in a manner similar to the Westinghouse type engine. The head of the cylinder of this engine is made of a piece of flat brass soldered to one end of the cylinder. Holes for screws are drilled in this plate to provide a means of fastening the cylinder to its face. The valve chamber is soldered to the side of the cylinder in a groove made with a rat-tail


WALKING-BEAM ENGINE
DETAILS.
1 REQUIRED, MATERIALS AS INDICATED.
SECTION OF VALVE.
2 REQUIRED, WOOD.
BRASS TUBE.


DETAILS OF WALKING-BEAM ENGINE
1 REQUIRED, WOOD.
1 REQUIRED, WOOD & LEAD.
WEIGHTS.
1 REQUIRED, WOOD.
1 REQUIRED, WOOD.
1 REQUIRED, BRASS.
1 OF EACH REQUIRED, 18 G. COPPER.
1 REQUIRED, BRASS
1 REQUIRED, WOOD.

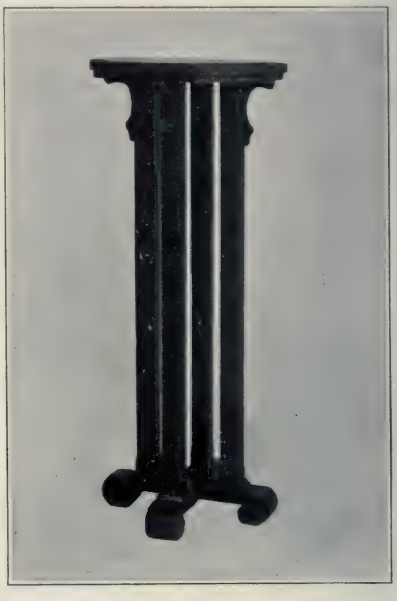
file. The base and valve chamber are wired in place on the cylinder and the soldering done in one operation.

The bearings of the main shaft are made of brass tubing fastened as shown. The valve gear is driven from the crank and should be connected up exactly as in the drawing since this engine will run in one direction only.

Fred P. Reagle, Montclair, N. J.



WASTE BASKET.



PLANT STAND.

PLANT STAND

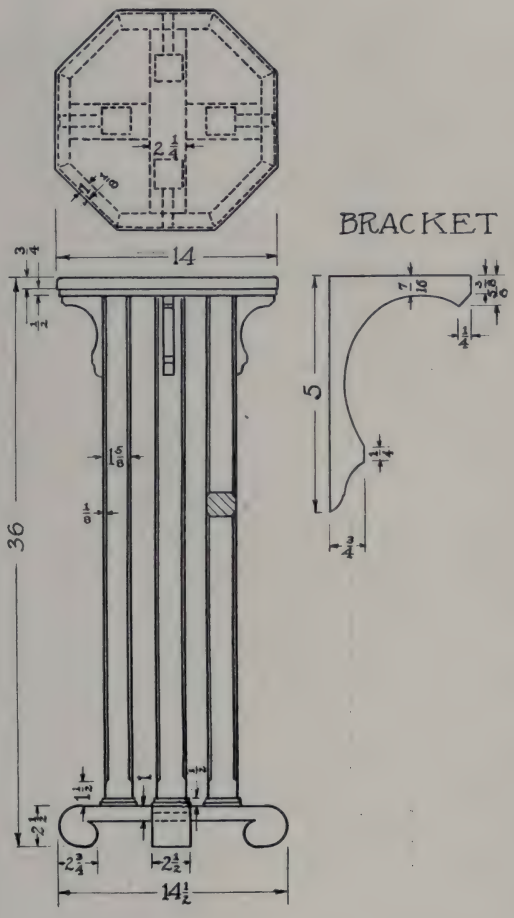
An unusual, yet attractive plant stand is shown in the drawing and photograph contributed by Newton Van Dalsem, of Neenah, Wis. This project offers opportunity for good tool work as well as the expression of feeling in curved lines. Altho a given height is indicated in the drawing this dimension is expected to be varied to suit conditions.

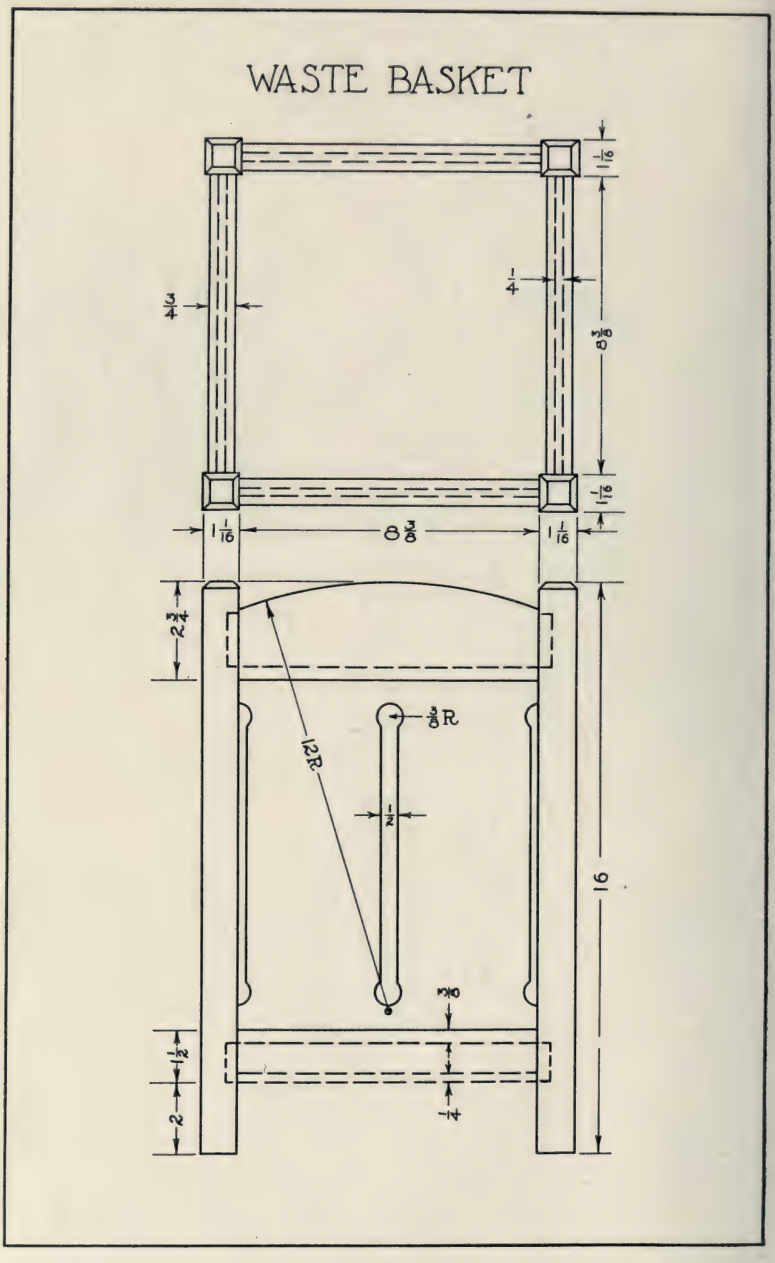
WASTE BASKET

Probably every shop finds odd pieces of stock collecting during the year. An attempt to make use of such material led to the design of the waste basket shown herewith. While quartered oak is preferable, almost any kind of wood may be used. The panels are set into a groove cut into the upper and lower rail wth a dado saw. The opening in the panel may be modified as the student may desire.

W. G. Emerson, Washington, New Jersey.

PLANT STAND




WASTE BASKET
1/16
1/4
4 1/4
8 3/8
1/16
1 1/16
8 3/8
1 1/16
2 3/4
3/8 R
12 R
1/2
16
3/8
1 1/2
2
1/4

REVIEWS

The Brown Mouse. By Herbert Quick, editor of *Farm and Fireside.* The Bobbs-Merrill Company, Indianapolis, 1915. 5x7½ in., 310 pages, price $1.25 net.

In this very wholesome story of farm community life in Iowa, Mr. Quick has given us a glimpse of a new type of rural education which is in harmony with the progressive thought of the present day. The hero of the story is a farm hand who has supported his mother by his work, and has fed his mind from books in the evening. After he has absorbed much of the best in literature and the government publications on the science of agriculture, he becomes the teacher in the district school. He begins at once to produce a new type of school in which the center of his curriculum is in the activities of the community. Arithmetic, language, science, literature all grow out of the community life. The real problems of the community become the problems of the school. After much opposition this Lincoln-like reformer gets recognition from the professor of agriculture at Ames, and then is appreciated at home. After more victories he gets his fine modern school plant with shops, kitchen, farm, cooperative creamery, cooperative laundry and an auditorium which becomes the community center. He also wins the love of the daughter of the man for whom he had worked many years. As a story it is thoroly entertaining, and as a book on rural education it is a powerful argument, and full of instructive suggestions.

Home-Made Toys for Boys and Girls. By A. Neely Hall. Lothrop, Lee & Shepard Company, Boston. 5½x7½ in.; 217 pages, price, postpaid, $1.40.

The author is well known to many boys and girls thru his handicraft volumes, and magazine and newspaper articles. As a result they have been able to construct toys that would do credit to Santa Clause' master toy-makers. The present volume is a collection of the best material that the author has published in various articles, and contains a fund of toy-making information.

It has been said that there will be a shortage of toys this year, due to the war, but with this book, boys and girls cannot only make their own toys, but add to the joys of their little friends by remembering them also. The materials required are little more than the pick-up material found in the average home, and being able to say "I made it all myself" is compensation enough to satisfy the ambitious boy or girl.

Included in the list of toys are windmills, kites, aeroplanes, motor-boats, electrical toys, doll house, doll-house furniture, cigar-box toys, spool and cardboard toys, and a reflectoscope.

Raffia Basketry as a Fine Art. By Gertrude Porter Ashley and Mildred Porter Ashley. Published by the Authors at Deerfield, Massachusetts. 6¼x9¼ in.; 45 pages; price $2.00 plus postage.

The spirit that animates the Deerfield industries characterizes this book. One quickly discovers that the authors are craftsmen who delight in their work. As a result we have illustrations of baskets that appeal to one's sense of form,

design and color, as well as good workmanship and use. An appreciation of painting, tapestry and pottery are expressed in the variety of baskets shown. The illustrations include four beautiful color plates.

The process of making raffia baskets of various shapes is explained fully in detail by means of drawings and photographic illustrations. Several varieties of handles with graceful curves are introduced. Conventional designs of flowers, butterflies, moths, dragon-flies, and designs suggested by a study of tapestry and fabrics from foreign lands are shown. The most ambitious type of design takes its motif from a landscape. There are several examples of the "landscape basket."

In the latter part of the book the use of the various grasses, corn husks, and grape vines for basket-making are described and illustrated.

The Education of the Negro Prior to 1861. By Carter Goodwin Woodson. G. P. Putnam's Sons, New York, 1915. 5¼x7¾ in.; 454 pages; price $2.00.

This account of the successful striving of the Negroes for enlightenment under the most adverse circumstances, and of the sacrifice and heroic endeavor of their teachers and benefactors reads more like a romance than a statement of historic fact. It is a remarkable record of race progress.

The part of the book that will particularly interest many of our readers is the chapter on vocational training. This contains some very interesting side lights on the manual labor schools of 1835 to 1845, and gives the educational ideas of Frederick Douglass which have too often been overlooked in reviewing the period just following the manual labor movement. It seems that Douglass saw more clearly than most of the men of his time the essential elements in industrial education. Douglass was opposed to an industrial school where pupils should merely earn the means of obtaining an education in books. He would establish "a series of workshops where colored men could learn some of the handicrafts, learn to work in iron, wood and leather, while incidentally acquiring a plain English education." He would place the emphasis on the education that comes thru the work, and would make the book training subordinate or supplementary to the work. In other words he advocated and approved the present-day theory of vocational education fifty years before our present-day prophets had caught their vision.

Profitable Vocations for Boys. By E. W. Weaver and J. Frank Byler. The A. S. Barnes Company, New York. 5x7½ in.; 282 pages; price $1.00.

It has been the purpose of the authors "to provide in this book a brief summary of the available information relating to the conditions for admission to the principal gainful occupations, and to present in suggestive forms the method by which the workers may advance themselves."

For reasons patent to all who are familiar with the lack of industrial standardizations, the authors do not pretend an exhaustive treatment of the subject. However, the book contains a detailed study of the printing, metal, electrical, building, woodworking, textiles and clothing industries, together with a briefer review of quite a number of other industries. In addition, the opportunities in the fields of stenography, advertising, banking, brokerage, insurance, civil service,

teaching, social work, graphic arts, engineering, chemistry, architecture, dentistry, medicine, law, and journalism are covered more or less briefly. One of the valuable features of the book is the list of reference books at the end of each chapter bearing on the special subject under discussion.

Parents and teachers who are called upon to advise with boys concerning their choice of vocations would find this book very helpful. In fact, a thoughtful reading of the book would repay every ambitious boy.

Decoration of the School and Home. By Theodore M. Dillaway. Milton Bradley Company, Springfield, Massachusetts. 7¼x9¾ in.; 211 pages, price $2.

Environment in its material sense and its influence on the development of growing children is the real theme of this book. The first part treats the subject from the standpoint of the school and grounds; the second from the standpoint of the home.

There is good and bad school architecture, and there are artistic and crude ways to lay out school grounds. The text is full of practical suggestions relating to these subjects. It sets forth comprehensively—with the reason for it—the proper selection and artistic arrangement of statuary, pictures and other objects in the school corridors, halls and rooms.

In the discussion of home decoration teaching by comparison has been very successfully employed. The elements of good and bad taste in furniture, rugs, draperies, wall coverings, lighting fixtures, bric-a-brac, and pictures are described and illustrated. The points are all well made. An appreciative reading of the book will stimulate iconoclastic tendencies in one who is already rebelling against his material environment. It is indeed a book with a purpose.

The Essentials of Business English. By Porter Lander MacClintock. Published by La Salle Extension University, Chicago. 5½x7½ in.; 237 pages; price $1.40.

This book covers just the field that is indicated by its title, and does it admirably. It begins with grammatical corrections in inflection, agreement and government, and continues with diction, vocabulary, clearness, effectiveness, spelling, punctuation, and business composition.

It is a rare person who could not read this book with profit, and certainly every one whose duties lie largely in business correspondence would find the oft-times perplexing question concerning a word or phrase entirely cleared up by reference to this book. In fact a careful study of the book would make the need for such reference of seldom occurrence.

The Boy Mechanic. Volume II. Popular Mechanics Co., Chicago. 7x10 in.; 473 pages; price $1.50.

To the boy of mechanical bent this book is a veritable gold mine. It is a compilation of material formerly published in *Popular Mechanics* and covers the construction of almost everything that delights the average boy, including deviecs for winter sports, indoor games, electrical novelties, boats, fishing rods, camps and camp appliances, reed furniture and kites and gliders. Some idea of the scope of the book is suggested by the statement that it contains 995 illustrations.

The Best Private Schools. Porter E. Sargent, 50 Congress Street, Boston, Massachusetts, author and publisher, 4½x7 in.; 514 pages; price $5.00.

The private schools for both boys and girls in the United States and Canada offering general and technical education, are listed. A short description of each school is given. The book also contains a list of the publishers, teachers agencies, dealers in school supplies, etc.

RECEIVED

A Reply to Superintendent Shallow's Report on the Gary Schools. By Alice Barrows Fernandez. Reprint of an article published in the New York Tribune.

Monthly Review of the U. S. Bureau of Labor Statistics. July 1915.

This is volume 1, number 1 of a publication which will "deal with such news items of labor as may officially come" to the notice of the Bureau. Communications concerning it may be sent to Royal Meeker, commissioner, Bureau of Labor Statistics, Washington, D. C.

Making Art Popular Through the Library. An account of the art work in the St. Louis Public Library, by Mary McEachin Powell. A fifty-page booklet with illustrations by students of the St. Louis School of Fine Arts.

A Survey of Opportunities for Vocational Education in and near Philadelphia. Compiled by Jane R. Harper. Published by the Public Education Association, 1015 Witherspoon Building, Philadelphia, Pa. James S. Hiatt, Secretary, price 25 cents. A 138-page report.

Industrial Arts. State Course of Study for the Public Schools of Indiana. Bulletin No. 19, issued by the Department of Public Instruction, Indianapolis, Indiana.

Domestic Science. State Course of Study for the Public Schools of Indiana. Bulletin No. 20, issued by the State Department of Public Instruction, Indianapolis.

Course of Study for the Training School. Quarterly Bulletin, State Normal School, Platteville, Wis. Contains outline of work in the manual arts.

Jewelry. Supplement to the Bulletin of the Metropolitan Museum of Art, New York City, June, 1915. Contains illustrations of many of the historic pieces in the Museum.

Home and Industrial Arts. A detailed outline of these subjects for grades one to five inclusive in the public schools of Louisville, Ky. By Sarah Logan Rogers, supervisor.

Catalogue of Wentworth Institute, 1915-16. Boston, Mass.

MANUAL TRAINING AND VOCATIONAL EDUCATION

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FOREWORD

TWO very important questions will be answered, at least tentatively, at the next session of Congress: The first is on national defense, the second on national aid for vocational education. Important as may be the former, the latter is certainly important, and is not entirely separate from the former in results aimed for. In these days when the machine is the engine of warfare as well as of commerce and industry, the efficient mechanician and industrial worker is a strengthening factor in national defense as well as in business. We believe, therefore, that our readers will be glad to see the analysis of the Smith-Hughes Bill, the first article in this issue, by *Alvin E. Dodd* of the National Society for the Promotion of Industrial Education.

The second article concludes the account of the origin and growth of the rather remarkable movement to train teachers of salesmanship so ably begun in our November issue by *Miss Cassie L. Paine,* of Boston. The article by Miss Merle Higby on the non-commissioned officer in industry gives one of the many results that are coming from the recent Minneapolis survey. The course suggested in the article, as having been adopted by the Minneapolis school board, is one that is needed in many other high schools, especially in cities of 100,000 or more inhabitants. In the article on the attitude of the National Association of Corporation Schools the editor makes the point that the advent of the corporation school does not materially lessen the demands upon the public schools for vocational training because the majority of industrial workers are not employed by the great corporations, and are not engaged in the highly specialized work for which most corporations are training their employes. In connection with this article the editorial item on "Where Shall Cooperation End?" may be of some interest.

The article by *Arnold Levitas,* outlines the course of lectures and practical work in typography and proofreading which has proven effective in a public evening school in New York City. *H. Williams Smith's* article in this number is much more than an appreciation of the craftsmanship of the head inspector of manual training in the City of London; it is a message full of fraternal spirit and love of beauty—almost a sermon to the manual training teachers of America; and a message that is most timely.

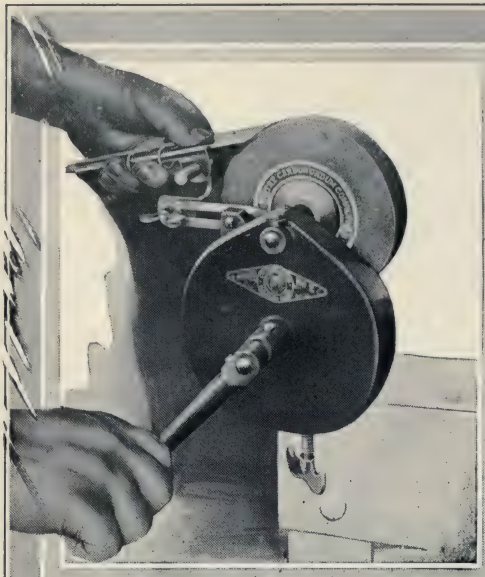
Many teachers will be especially interested in the blank quiz sheets described by *I. O. Royce.* These are suggestive of the study of methods of teaching the manual arts that is going on at the University of Missouri. *F. C. Vincent's* article on electric toasters and plates will be suggestive to teachers of metalwork.

About a year ago we published an article on upholstery which gave just the practical help that many teachers needed. We are glad to supplement this with another article in this issue by the same author, *Emil A. Johnson,* of Bradley Institute.

This Magazine is kept for sale at McClurg's in Chicago, and Brentano's in New York.

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It's Easy to Grind Right with this Tool-Grinding Guide

THE simple, yet practical, tool-grinding guide is only one of the several features of the

Carborundum Niagara Grinder

The tool is held in the guide by a steel spring clip.—The exact bevel for any tool is obtained by simply tipping the tool holder up or down on a slide rod—no troublesome adjustments—this guide is student-proof—and every Carborundum Niagara Machine is equipped with a Carborundum wheel the fastest, cleanest, coolest cutting wheel for general grinding—every machine is smooth running, durable.



Ask your hardware dealer about Carborundum Niagara Grinders and Carborundum Sharpening Stones.

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NIAGARA FALLS, N. Y.

FIELD NOTES

AT the request of the Boston finance commission and Mayor Curley, James H. Van Sickle, superintendent of schools in Springfield, Massachusetts, is conducting an investigation of the expenditures of the Boston school committee. In this investigation he has the assistance of Dr. Leonard P. Ayres, of the Russell Sage Foundation; Dr. George Strayer, of Teachers College, Columbia University; E. H. Carris, deputy commissioner of education in New Jersey; and E. E. MacNary, supervisor of manual training in the Springfield schools.

Each of the investigators will take up a separate phase of the question. Dr. Ayres will compare the various items of cost in Boston with similar items in other large cities. Mr. MacNary will study the industrial and pre-vocational work.

Ambitious young men entering the navy have an opportunity to learn one of a number of trades, and even to receive training in a few professions. A trade school for teaching these trades is permanently maintained at the arsenal barracks in the city of Washington, the instructors being officers of the corps. Other schools more or less temporary, are conducted at various army posts wherever troops may happen to be stationed.

A military engineer is required to be a sort of jack of all trades. He may be called upon to run a locomotive, operate a saw mill or a flour mill, feed troops, meet a demand for lumber for building bridges on short notice, to do emergency repairing, plumbing and pipe fitting, or, on occasion, install a system of pipes for water, with pumping machinery. A graduated electrical sargeant's work consists in operating and repairing the electrical equipment of seacoast fortifications. At the conclusion of his time of service he is assured of a well-paid position in civil life. These various lines of training carry with them a moderate salary, with board, lodging, and clothes.

Boston now has evening classes in 30 schools in which special emphasis is given to industrial and vocational training. Young men and young women have an opportunity to supplement their daily employment with studies related to their occupations. Nine evening high schools are furnishing every facility for young people deprived of day schooling, to graduate.

A new experiment is to be tried out this winter. The board of education intends to arrange for immigrant mothers with families of small children to spend a few hours in school each day studying English or any other branch that will make them better understand America and American ways. Nurses will be provided to care for the children during the absence of the mother.

The seniors in the high school at Knoxville, Tennessee, are to gain some first-hand knowledge concerning vocational work. Under the direction of the English department a systematic survey of the occupations and industries of the city is to form a part of the curriculum of the high school. The survey will cover condition of workers, maximum and minimum wages, chances for promotion, and any other information that will serve to throw light on the character of the specific vocation. A study of the social, civic and economic conditions of the city will be made.

This work will include also a course of reading bearing on the various vocations, the information thus obtained to be the basis for composition work in the English classes. The knowledge gained by the actual survey work and the prescribed reading will be supplemented by talks to the entire school by men and women of the city on some of the typical vocations.

The second meeting of the Northwestern Pennsylvania Arts Conference was held in Warren on Saturday, November 6th, with more than forty special teachers in attendance. The State of Pennsylvania has been divided into six geographical districts, and conferences of teachers of manual arts, domestic arts, household arts, vocational education, music and drawing will be held in these districts in the autumn and in the spring of this school year.

At the Warren meeting the morning session was devoted to a general discussion of the Continuation School Law and its effect on the voca-

(*Continued on p. VI.*)

tional work, on vocational guidance and a cost system for the arts. At noon a luncheon was served by the pupils in the State-aided household arts department at Warren. In the afternoon the teachers met in sectional round tables on the manual arts, the domestic arts, and music and drawing. Following these round tables the Women's Club of Warren furnished automobiles to take the visiting teachers on a trip to view points of interest about the community.

Representatives teachers were present from Erie, Titusville, Youngsville, Ridgway, Corry, Kane, Bradford, Harrisburg and Jamestown, New York.

The next meeting will be held in Ridgway, Penn., sometime in April.

In Denfield, Minnesota, the manual training students in the high school are enthusiastic about making playground apparatus, such as turning bars, swings, benches, and other useful articles. These students are actively engaged in learning the rudiments of practical trades and are anxious to put their newly-acquired knowledge to use. They now have on hand several castings made in the foundry shortly before school closed last spring. From these castings they plan to make lathes for the machine shop. Other articles for school work, such as levers broken while in use in the school work, seat supports, etc., will be made. The students begin work in the shop at 7:45 a. m. and continue until 10:50 a. m.

Under the direction of Harvey G. Hatch, director of industrial education, West Springfield, Massachusetts, considerable stimulus was given to home garden work this past summer. The most ambitious boy raised 90 bushels of onions which he expects to sell at $2.00 a bushel, and 6,600 roots of celery which should bring two cents a root. Materials and labor that he could not furnish himself cost $11.76. Several of the other young gardeners will clear about $50.00 as a result of their summer's work.

An evening school for teachers has been opened in the Teachers Training School, Buffalo, New York. It will aim to give teachers additional opportunity to prepare to specialize in certain lines and to brush up in other work. The range of courses is quite varied and includes story telling for primary grades, business correspondence, commercial photography, bookbinding, camp cookery, and manual training for the fifth and sixth grades.

In explanation of the 69% increase in attendance in the industrial arts courses at the Oregon Agricultural College, Corvallis, Oregon, Professor Frank Shepherd says:

"The equipment in the woodworking shops, the machine shops, the drafting rooms, the foundry and plumbing shops is by far the best and most nearly complete provided by any school on the Pacific slope that is attempting to fit teachers for manual training. And the faculty of fourteen people offer courses that are in demand by leading schools of the country."

Last fall this institution received calls from six western states outside of Oregon for manual training teachers, but it was not even able to supply the calls in its own state.

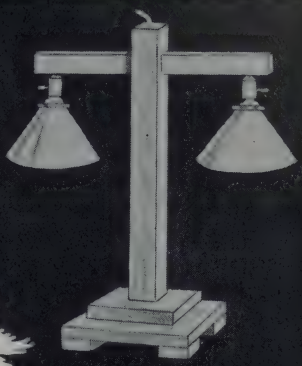
In and around Philadelphia the various institutions for orphan girls have available resources in the form of endowment to the extent of $20,000,000. Restrictions imposed by the founders and the lack of cooperation between the institutions have prevented the realization of the full benefit of this large sum. As a result of these conditions there has been much over-lapping of work, and in order to bring about an increased efficiency a conference of educators and experts was held recently under the direction of Dr. H. H. Hart, director of the Department of Child Helping of the Russell Sage Foundation. In making an investigation Dr. Hart found that out of 27 institutions caring for orphan girls, 26 had developed efficient plans for vocational education.

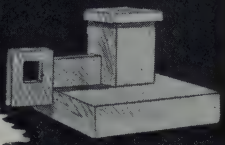
The mechanical department of the Rhode Island school of design, Providence, R. I., has recently moved into new quarters which will enable students to work much more efficiently than was possible formerly. For several years this department has been growing so rapidly that it has been a constant problem to provide neces-

(*Continued on p. VIII.*)









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Well-made models deserve the finest finish --and a beautiful finish will minimize the defects of a poorly constructed model.

Johnson's artistic finishes are especially recommended at Christmas time when everyone is in a hurry. They take to the wood so naturally and dry so quickly—can be applied at practically the last minute — transforming your models into gifts of permanent beauty.

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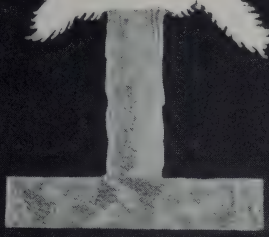
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sary accommodations. An entire four-story building covering about 15,000 square feet, is now devoted to the mechanical department.

Herbert W. Roberts, supervisor of manual training in Muncie, Indiana, has placed the following equipment in the new high school: 12 motor head variable speed lathes, a 14″ universal saw, a 12″ jointer, a vertical hollow chisel mortiser, a tool grinder, and a band-saw. All the machines are individual motor driven. A forge shop is under consideration which will consist of some sheet metal and die work, in addition to the forges.

Robert J. Service, formerly instructor in manual training in the high school at Trenton, New Jersey, is now director of manual arts in Kingston, New York. Mr. Service has just installed the following new equipment in the high school: three underdrive 12″ speed lathes and one direct drive 12″ speed lathe, an 8″ oilstone grinder, a 24″x 6″ single surfacer, a 6″ hand planer, a saw table with hollow chisel attachment, one 30″ band-saw, 20 benches of the 12 drawer type, a 10″x15″ job press and a 30″ paper cutter.

Emphasis on the practical results of manual training work marks the work in the high school at Eveleth, Minnesota. In addition to playground apparatus, a repair squad has been appointed from the plumbing class to make all plumbing repairs on the school buildings and grounds. The students in the cement working class are making the standards for the volley ball courts, while in the woodworking class the students are constructing a desk and office furniture for the bank which will be opened by the students in the commercial department.

Preparatory to the opening of the city evening schools and trade classes in Quincy, Massachusetts, this fall, posters and flyers were printed and distributed advertising the courses and the conditions under which they could be taken. This was also done in connection with the opening of the Evening Industrial School at Chicopee, Massachusetts.

The problem of caring for maimed and disabled soldiers is being worked out by France. The aim of the government is to make them self-supporting, which means providing a system of re-education. Trade school instruction is being instituted in many places. At present there is great need of men who can repair American farm machinery, tractors, etc., and a number are being trained for this work.

According to the bequest of George M. Pullman, the manual training school which he has founded in Pullman, Illinois, is "for the benefit of the children of persons living in or employed in Pullman." The course covers four years. The school equipment will include a model home in the shape of a flat in which girls will take up their residence by fours for two weeks at a time to learn home making under actual conditions.

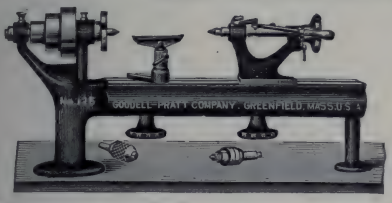
The second year of the night school for working men and apprentices has just been opened by the board of education in Louisville, Kentucky. The equipment in the manual training high school will be utilized for instruction in woodworking, machine shop and forge work, mechanical drawing, blueprint reading, electricity, chemistry and arithmetic. A year ago when the work was first inaugurated 400 enrolled, and within a few days it became necessary to employ additional teachers.

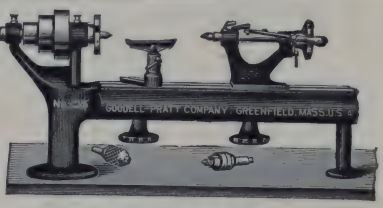
In Allentown, Pennsylvania, social centre work in the public schools is growing rapidly. The work is under the direction of the board of education and was first started three years ago. The results have been so satisfactory and far-reaching that other sections of the city are urging extension of the work. Provision is made for domestic science for the girls and manual training for the boys. These courses also include lectures on topics of general welfare. One of the first to be given this season is "Quarantine, and the Need of Observing the City's Regulations." It is quite significant that social workers observe an improvement in the tone of the neighborhod where social centre work is carried on.

(*Continued on p. X.*)

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LET US TELL YOU WHY

our No. 125 Lathe with its equipment is especially adapted for use in trade schools.

Write for Lathe Booklet.

This lathe can be driven by foot power or by your shafting. It is 12 inches between centers and swings 5 inches. Costs from $20.00 to $100.00.

This lathe attracted a great deal of attention at the Industrial Education Exposition in New York. Ask the man who was there.

Goodell-Pratt Company *Toolsmiths* **Greenfield, Mass., U. S. A.**

Aren't DISSTON TOOLS the tools for *your* classes, too?

The Supervisor of Manual Arts, St. Paul, Minn. says:

September 29, 1915.

Henry Disston & Sons, Inc.,
Philadelphia, Pa.

Dear Sirs:—

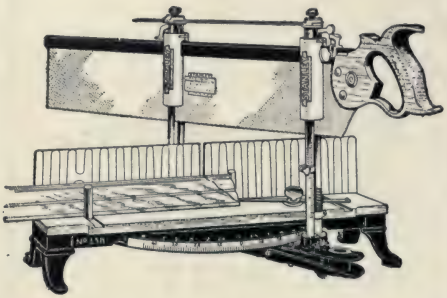
Having used your Saws, Files and Saw Jointers for many years under the most trying conditions to which tools could be put, I am compelled to express to you my appreciation of the sterling worth of DISSTON TOOLS. Scientific investigation and research of the highest type must have been used for many years in order to bring your tools, especially your line of hand saws, to the high state of efficiency in which they now work.

Very sincerely,
(Signed) DONALD V. FERGUSON
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Isn't that the kind of tools you want?

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Stanley Tools



Stanley Mitre Box

Strong --- Durable --- Accurate

A Few Striking Features

Saw is held above work when not in use.

Swivel is automatically locked at any angle.

Two sockets in swivel for use of long or short saw.

Narrow opening in back of frame, especially adapted for small work.

Steel rod uprights for saw guides.

Uprights adjustable for saws of varying thicknesses and for those that run out of true.

Stock guides for holding work in place.

Extra wide range of work—will saw at angle of 30 degrees.

One-Piece frame with detachable malleable iron legs.

Construction thoroughly mechanical—all parts interchangeable and readily replaced if lost.

Quickly and easily put together or taken apart for carrying.

A specially made back saw furnished with each box.

STANLEY RULE & LEVEL CO.
NEW BRITAIN, CONN. U.S.A.

FIELD NOTES.

(*Continued from p. VIII.*)

The School of Education of the University of Pittsburgh received this year a greater increase in enrollment than any other school of this rapidly growing university. Although the school has been in existence only five years, it ranked second in enrollment among the University Teachers' Colleges of the United States last year, according to a survey published in Science, and this fall there have already matriculated twenty per cent more classified students than in the fall of 1914. Four instructors were this year added to the faculty of the School of Education, which now numbers thirty-eight. New temporary buildings on the campus, with additional rooms in State Hall, provide for the increased number of students.

Martin L. Olsen, formerly pre-vocational instructor of machine shop practice in the Quincy School, Boston, has recently been appointed as instructor in "cooperative branches" in the Hyde Park High School. He will conduct courses in mechanical drawing and shop mathematics. The Hyde Park High School has sixty boys in the entering class of the industrial department, who, after the first year, will be employed alternate weeks in the local industries.

Mr. Olsen is succeeded in the Quincy Prevocational Center by H. Fisher, formerly instructor in the apprentice school of the General Electric Co., West Lynn, Massachusetts.

Francis L. Bain, director of manual training, Everett Public Schools, has accepted appointment to the Boston service as instructor of "cooperative branches" in the Dorchester High School.

The School of Applied Industries of Carnegie Institute of Technology recently announced the introduction of a course for the training of men in the sheet-metal industry. The course is open to beginners, the minimum age for entrance being 17 years, and to men already engaged in the trade. Instruction is offered in both day and evening classes. The facilities for thoro training are adequate to meet the needs of the skilled worker from both a theoretical and a practical standpoint.

(*Continued on p. XII.*)



This bench is admirably fitted for sectional classes.

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Our designers, superintendents and workmen take as much pride in every article that leaves this plant as any instructor can possibly feel in the student that goes forth, thoroughly trained, from his school.

Pre-eminently it is for instructors who can differentiate between Mechanical Equipment and Educational Equipment.

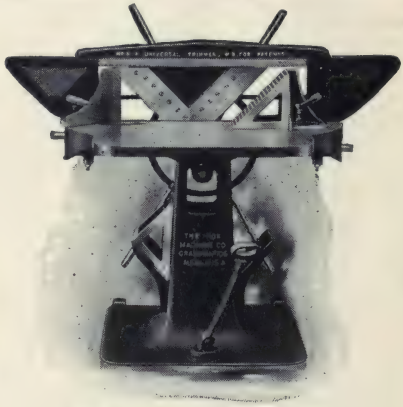
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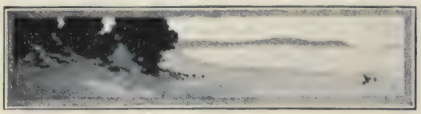


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WASH METHOD OF HANDLING WATER-COLOUR

By FRANK FORREST FREDERICK

A helpful guide, affording a stimulus to the use of water-colour as practiced by the ear ier painters, a process which drawing teachers recognize should be more generally and thoroly taught.

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Anthony's Elements of Mechanical Drawing
Gives a thorough drill in geometric construction and the theory of projection as applied in a wide range of practical drawing. **$1.50.**

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A handbook and text, valuable as a brief course, covering the essentia's of the subject. **$1.50.**

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Halstead's Working Drawings for Cabinet-Making Models
A collection of working drawings of furniture for high school classes. **$2.00.**

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A collection of working drawings of models for the 5th, 6th, 7th and 8th grades. **$2.00.**

Reilly's Rational Athletics for Boys
Commended by the leaders in physical education. **90 cents**

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BOSTON NEW YORK CHICAGO

100 BEAUTIFUL DESIGNS OF EASY--TO--MAKE FURNITURE

A wonderful collection of designs for simple, easy to make furniture by practical furniture designers of recognized ability. Each design is shown in perspective and in detail to scale. The drawings are fully explained and every piece is easy to make. Especially valuable to the teacher of furniture design and construction. - - - - - - - - **Price $2.00**

CRATER & HOLT, Grand Rapids, Mich.

FIELD NOTES.

(*Continued from p. X.*)

An organization of the manual training and industrial arts teachers of New Jersey, has just been formed with Frederick P. Reagle, of Montclair, president, Miss Caroline Stephens, of Newark, secretary, and John J. Hatch, also of Newark, treasurer. The purposes of the organization as set forth by Mr. Reagle, are both social and professional. On the professional side he urges the need of improving the general standard of the manual training work in order that it may continue to receive the recognition which it deserves.

Increased impetus hase been given the cause of education in Minneapolis by the influence of the Dunwoody Institute. The public demand for it is expressed by overflowing classes in the Institute and in the public night schools. Both the day and night classes at the Institute have long waiting lists.

The opening of the evening classes in the Bridgeport Trade School, Bridgeport, Connecticut, taxed the school to its capacity. Courses for men and women employed during the day are offered in any trade for which there is sufficient demand. The school is kept in operation six nights each week for 32 weeks in the year.

A wide range of evening industrial and mechanical courses is announced by Rindge Technical School of Cambridge, Massachusetts. These courses serve as continuation courses for men desirous of perfecting themselves in their chosen trades. The curriculum includes machine shop, blacksmithing, carpentry, general woodworking, pattern-making, shop mathematics, printing, electricity, architectural and mechanical drawing and estimating for carpenters.

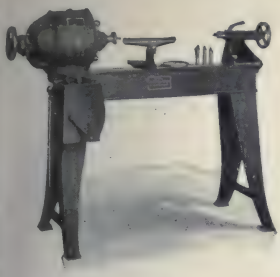
The vocational schools in Boston are making wooden door-plates for the school rooms of all school buildings in the city. Each door-plate will bear the name of the teacher of the room. This will enable children sent on errands from one room to another, and parents visiting the schools, to go direct to the right room. It will require 1,600 door-plates to supply the entire list.

(*Continued on p. XIV.*)

EVERYTHING FOR THE
MANUAL TRAINING AND
FORGE ROOM—

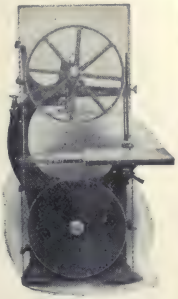
QUALITY TOOLS FOR QUALITY SCHOOLS

Ask the educator who knows.
Let us have a list of your requirements,—NOW.

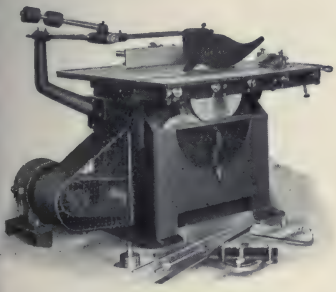


No. 53 Motor Head Speed Lathe

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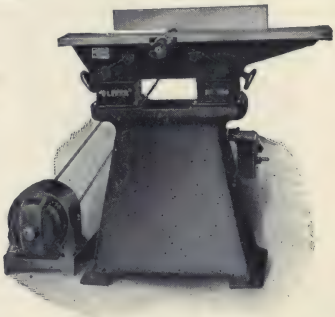
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A booklet on how to sharpen and properly set Saws of all kinds. There is one *right* way to do this. Why not know how by reading this booklet. Write for FREE BOOKLET containing information valuable to all students.



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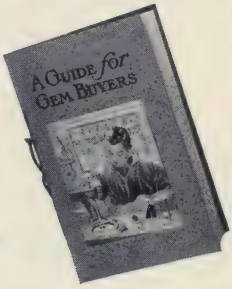
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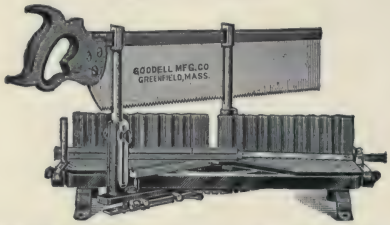
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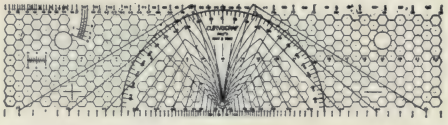


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A drawing instrument which saves time and trouble. Easy to use, practical and durable. Write for circular. Price, with instructions, $2.00.
JOHN W. WHALEN GRAYMONT, ILLINOIS

FIELD NOTES.

(*Continued from p. XII.*)

Wallace E. Hackett, until November 1, director of practical arts in Reading, Pennsylvania, has just been appointed a supervisor of industrial education for the State of Pennsylvania. There are now three supervisors of industrial education in addition to the director. In September E. L. Bowman and Stanley A. Zweibel, the other two supervisors, together with D. H. Atherton, director of manual arts in McKeesport, made an industrial survey of the city of McKeesport, visiting every industrial plant and every employer of men in the city.

For the past year the United States Bureau of Education has been working on plans for organizing a National Rural Teachers' Reading Circle. In cooperation with an advisory committee of state superintendents the final plans have been worked out and are now ready to be put into operation. Thirty states have joined the circle and only teachers residing within these states will be permitted to join.

The books to be read are classified under five heads as non-professional books of cultural value, educational classics, general principles and methods of education, rural education, and rural life problems.

Last year the Indiana Industrial Teachers' Association became a section of the Indiana State Teachers' Association which resulted in an increase in membership of almost one hundred, and the membership has been growing ever since. On October 28th and 29th the regular meeting was held in Indianapolis.

Registration in the evening classes at the Girls Vocational High School in Minneapolis was double the number expected. The courses offered cover plain sewing, dressmaking, art

(*Continued on p. XVIII.*)

We Have Plenty of Reeds
Best Quality, Exceptionally Smooth, of our own manufacture.

Send for free catalogue M of reeds, chair cane, raffia, dyes, sweet rgass, bases, books, etc.,—everything for basket making. Orders sent by parcels post day received. Learn basketry. It is simple, inexpensive, and does not hurt eyes. Any of our easy books we sell will show you how. Free instruction book given with first $5.00 worth of orders to each new customer to January 1, 1915. Any amount sold from half pound up.

Louis Stoughton Drake, Inc., West Newton, Mass.



Illustration of our New No. 25A Outfit

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MANUAL TRAINING

For years we have studied the requirements of schools and the experience gained proves that the *best* Tools and Benches are the cheapest in the long run. They are more uniform in quality, last longer, give better results and in every way are preferable. Our hobby *since 1848* has been QUALITY and we aim to carry *only the best.*

To directors and instructors and all those who are interested in Manual Training we will send our Tool Circular No. 35.

HAMMACHER, SCHLEMMER & CO.
HARDWARE, TOOLS AND SUPPLIES
4th Ave. and 13th St. NEW YORK, SINCE 1848

RAFFIA BASKETRY
AS A FINE ART
A NEW BOOK BY
GERTRUDE AND MILDRED ASHLEY

The book is fully illustrated, both in color and half-tone, which will serve as mode s for designs. It is the result of fifteen years' experience in Raffia Basketry, both in making and teaching, in connection with the Society of Deerfield Industries. It treats of all stages of the development of a basket, from the beginning to the complet.on, including design in color, and many varieties of handles.

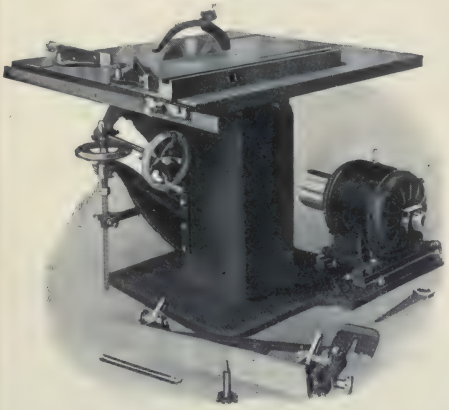
The book is intended for schools, craft-workers and institutes where basketry is taught.

Cloth, illustrated (including 4 color plates) $2.10 postpaid.

Mrs. Gertrude P. Ashley,
P. O. Box 142 **Deerfield, Mass.**

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SAW TABLES



Our No. 4 tilting table, with or without motor drive, is up-to-date for manual training. First class in every respect.

Write us.

ALEXANDER DODDS COMPANY
451-453 Monroe Ave., N. W.
Grand Rapids, Mich.

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I am headquarters for fancy cabinet woods, veneered stock and Manual Training Lumber of any kind. Tools, Benches and sundry items; Cooking Tables, Kitchen Utensils, etc. Small orders given the same careful attention as large ones.

STANDARD BLUE PRINT SERIES

Book TWO of "Bench Work for the Grades" now ready. Projects follow in logical sequence those of Book One. The same unique plan is followed as in Book One, the First years' work. Either book sent **FREE** for examination—also "Graded Projects for Advanced Wood-work."

A postal card costs one cent and may save you many dollars. Send it today.

EVERETT FRAIN
723 South Fifth Ave. - - - - Chicago

"AT YOUR SERVICE"

FIELD NOTES.

(*Continued from p. XIV.*)

needlework, millinery, cooking, economical buying and commercial branches.

Vacation earnings of students in the Lane teachnical school, Chicago, enrolled in pre-vocational, vocational, apprentices' school, high school and junior college departments for the summer of 1915 amounted to $57,101.77, according to the figures announced by William J. Bogan, the principal.

In the plans for night schools in our larger cities it is noticeable that the peculiar needs of the foreigners have received due attention. It has been estimated that in the night schools of Philadelphia last year the lives of 4000 foreigners were touched in a vital way.

An appropriation of $20,000 for a new trade school has just been made by Norwich, Connecticut. The building is to be three stories high. The first floor will be used as carpenter and machine shop; the second will be fitted up for the cotton textile department; and the third will contain the electrical department and drafting room.

Mrs. Ella Flagg Young has formally notified the Chicago board of education that with the expiration of her present term, which is December 8, she will retire from the superintendency of the Chicago schools.

In the educational exhibit at the National Implement and Vehicle Show, Peoria, Illinois, the work of the local manual training high school students was awarded half of the prize money. They won 12 first prizes and a number of second prizes.

Miss Helen Varick Boswell, chairman of the educational department of the General Federation of Women's Clubs, is recommending that clubs appoint vocational education committees to establish placement bureaus in the interest of this phase of education.

During the past summer the trustees of the trade school of the Massachusetts Charitable Mechanics Association, located in Boston, spent a

(*Continued on p. XX.*)



ARE YOUR PUPILS TRYING FOR THE SIMONDS PRIZE TOOL CABINET?

This beautiful $30 tool cabinet is one of the fifty-seven different prizes which we are offering to the boys who at home or in school can make during the next two months with carpenters' tools of any make the most useful or ingenious thing. The purpose of this contest, the particulars of which we called to your attention last month, is to arouse the interest of boys in using tools, encourage them to employ their constructive faculties in a useful way, and make both pupils and instructors acquainted with

SIMONDS SAWS

Over eighty years' experience in making cutting edge tools, the finest materials, and the most expert workmanship, go into the making of Simonds Saws. The result is a fast and sharp-cutting, easy-running, and finely tempered saw which holds its edge and set, does not bind or scrape or require frequent filing, will stand hard usage, and give perfect satisfaction. There is a Simonds Saw for every use of the professional and amateur workman, and all are absolutely guaranteed.

"If you want saws that cut like diamonds,
Ask for saws that are branded Simonds."

Write to Dept. 3 for particulars of the prize contest and for our booklet, "The Professor and the Saw", which contains much matter very interesting and valuable to manual training instructors.

Simonds Manufacturing Co. "The Saw Makers" **5 Factories 11 Branches**

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Do Better Work

because they are scientifically designed for practical work and promote in the student the habit of doing accurate work.

"RED DEVIL" Chisels carry a 2 years' insurance Bond. Blades made of high grade steel; handles of select hickory.

"RED DEVIL" Auger Bits have 10% greater clearance, bore with or against the grain, and feed themselves in without pushing.

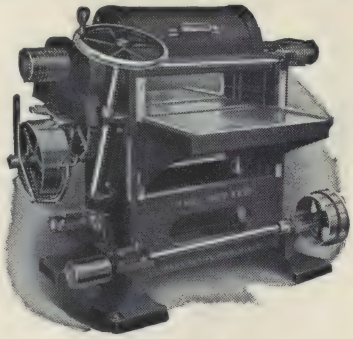
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Descriptive Catalogue Free. Write Today.

SMITH & HEMENWAY CO. Inc.

155 Chambers St. New York City

"The Porter" Single Surfacer



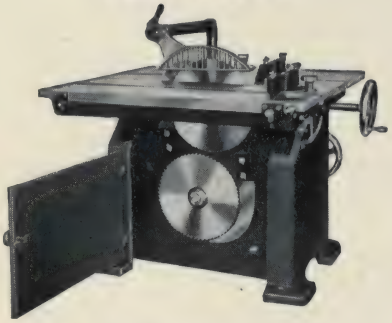
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We are willing to send you the machine on 30 days trial and if you are not convinced that it is a big bargain for the money, you may return it at our expense.

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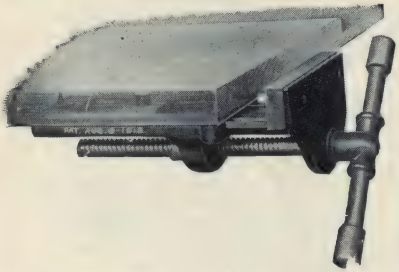
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THE BOYS



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It has the advantages of the continuous screw vice and is as rapid as the so-called quick acting vice.
It is not an experiment but has been thoroly tried out and perfected.
Made with or without dog for holding work on top of bench.
The very thing to replace your worn out wooden vises at small expense.
Send for circular.

A. L. BEMIS
72 Commercial St. Worcester, Mass.

FIELD NOTES.

(*Continued from p. XVIII.*)

large sum of money on improvements. The new quarters will enable this school to do its work much more effectively.

At a recent town meeting in Putnam, Connecticut, $20,000 was appropriated for the erection of the new Putnam State Trade School.

To extend the manual training work in Ayer, Massachusetts, it became necessary this fall to utilize the upper floor of an old engine house.

A feature of the vocational school in Lowell, Massachusetts this year is the introduction of a course in factory maintenance.

Under the direction of J. C. Wright, who is in charge of the vocational work in the public schools of Kansas City, Missouri, thoroughly practical vocational classes have been established in the Lathrop school for Saturday afternoons. These classes are adapted especially to meet the needs of apprentices who desire to perfect themselves in their given lines of work.

The ninth annual meeting of the National Society for the Promotion of Industrial Education will be held in Minneapolis on January 20, 21 and 22. The complete program will soon be announced. This will no doubt be the most interesting meeting yet held.

The manual training teachers in the public schools of Fort Worth, Texas, have organized a Manual Arts Association. C. M. Haines is president, and Mrs. M. G. Wright is secretary.



Illustrated Working Drawings of Type Models in Wood Working

Group 1a (10 illustrated plates with notes) 20c
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A set of 20 high school plates (not illustrated) ...30c
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Editions printed within 12 months:

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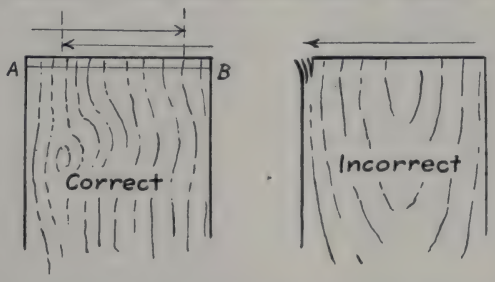
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WOODWORKING

Arranged by

GEORGE G. GREENE

Instructor in Lane Technical High School, Chicago, Ill.



A small-size, boiled-down textbook and note-book combined. It is a note-book which saves the time of both teacher and pupil; a practical help to the pupil to remember "what the teacher did and what the teacher said." It furnishes a few general and extremely important directions about tools and processes. It provides space for additional notes and space for working drawings of exercises and articles the pupil is to construct. In a brief, concise, simple way it tells about

Shop Conduct	**The Gage**	**The Plane**	**Nails**
The Rule	**The Saw**	**Boring Tools**	**Screws**
The Try-square	**The Chisel**	**Glue**	**Finishing**
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It is essentially a collection of helps, ideas, hints, suggestions, questions, facts, illustrations, etc., which have been prepared by a practical teacher to meet a real need in his own shop—a need which is identical in woodworking shops everywhere.

It is full of suggestions; shows a keen insight into subject-matter and teaching methods and is an effective teaching tool.

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ESSENTIALS OF WOODWORKING. By Ira S. Griffith.

A textbook written especially for grammar and high school students. The standard textbook on elementary woodworking. A clear and comprehensive treatment of woodworking tools, materials, and processes, to supplement, but not to take the place of the instructions given by the teacher. The book does not contain a course of models; it may be used with any course. It is illustrated with photographs and numerous pen drawings. Price, 75 cents.

HANDWORK IN WOOD. By William Noyes.

A handbook for teachers and a textbook for normal school and college students. The best reference book available for teachers of woodworking. A comprehensive and scholarly treatise, covering logging, sawmilling, seasoning and measuring, hand tools, wood fastenings, equipment and care of the shop, the common joints, types of wood structures, principles of joinery, and wood finishing. 304 illustrations—excellent pen drawings and many photographs. Price, $2.00.

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A small-size textbook and note-book combined. It furnishes a few general and extremely important directions about tools and processes; and provides space for additional notes and working drawings of exercises and articles which the pupil is to construct. It is essentially a collection of helps, ideas, hints, suggestions, questions, facts, illustrations, etc., which have been prepared by a practical teacher to meet a real need in his own shop. The note-book is full of suggestions; shows a keen insight into subject matter and teaching methods and is an effective teaching tool. Price, 15 cents.

PROBLEMS IN MECHANICAL DRAWING. By Chas. A. Bennett.

A students' textbook consisting of 80 plates, classified into groups according to principle and arranged according to difficulty of solution. It furnishes teachers of classes beginning mechanical drawing with a large number of simple, practical problems which have been selected with reference to the formation of good habits in technique, the interest of the pupils and the subjects generally included in a grammar and first-year high school course. Each problem is given unsolved and therefore in proper form to hand to the pupil for solution. Price, $1.00.

WOOD PATTERN-MAKING. By Horace T. Purfield.

A clear, concise treatise on the fundamental principles of pattern-making. It presents the best methods of construction and those most easily understood by the student. It is not arranged about a course of problems but may be used with any course. A practical text for high school, trade school, technical school and engineering college students. Written by an experienced pattern-maker and teacher of pattern-making and kindred subjects. Price, $1.25.

PRACTICAL TYPOGRAPHY. By George E. McClellan.

A remarkable textbook for students in printing. It contains a course of exercises ready to place in the hands of pupils, and explains and illustrates the most approved methods used in correct composition. A valuable feature of the book lies in the fact that in the early stages of the course the pupil sets up in type a description of what he is doing with his hands. It contains 63 exercises, treating of composition from "Correct Spacing" to the "Making up of a Book," and the "Composition of Tables." Price, $1.50.

DISCOUNT IN QUANTITIES

THE MANUAL ARTS PRESS, Peoria, Illinois

TRADE NOTES

In this issue the Goodell-Pratt Company are showing their No. 125 Bench Lathe. This lathe is adapted to home use as well as use in the school shop. It is 25 inches long, 12 inch high, and weighs 30 pounds. It takes all sizes of work up to 7 inches in diameter and 12 inches long. The head-stock has a No. 1 Morse Taper Socket with a ⅜ inch hole all the way thru. The tail-stock has a No. 0 Morse Taper Socket, and has both screw and lever feed. The lathe is furnished with an adjustable hand rest, slotted face-plate, saw arbor, and three-jawed chuck with a capacity up to ¼ inch. It can be operated by foot power, an electric motor, or from a main driving shaft. A small saw table, manufactured by this firm, has been made to fit on the lathe. A slide rest attachment holds tools for turning metal.

Under the title, "What to give the Boy," this firm is distributing a little circular suggesting the gift of tools at Christmas time. A gift of their automatic drill, hollow handle set of tools, bench grinder, small bench vise or amateur bench lathe would gladden the heart of any boy mechanic.

A worth-while business in the line of upholstery supplies is developing in the manual training, vocational and industrial schools. The Kunkle Furniture Manufacturing Co., Mackinaw, Illinois, is cultivating this trade in all its details. They specialize in cushions for chairs, cozy corners, porches, automobiles, canoes and launches. They also manufacture arts and crafts furniture and can supply the necessary finishing hardware for school products in furniture. They will be glad to send their complete catalog to all who are interested.

"Everything for Basket Making" is the slogan of Louis Stoughton Drake, Inc., West Newton, Massachusetts. Some dealers in basketry materials have found it difficult to supply the trade since the war began, but this enterprising firm is prepared to take care of every need in this line. Their catalog of materials for this interesting handicraft is the most complete we have seen. It includes reeds, willow, chair-cane, raffia, Indian ash splints, sweet grass, pine needles, braided rush and braided straw, in addition to the various

(*Continued on p. XXIV.*)

From 1½ inch blade— up to 30 in. long



Handles can't work loose on

"Yankee" Plain Screw Drivers

The big line of rigid blade screw drivers includes sizes that fit any job upon which a man wants to use a rigid blade screw driver.

"YANKEE" Plain Screw Driver handles won't loosen under the hardest usage. They are fastened to the blades by a "YANKEE" device that makes these drivers practically a one piece tool.

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Make Better Mechanics

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No. 90—Standard Style—14 sizes—2 inch to 30 inch blade.

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Write for "'Yankee' Tool Book" Free for Mechanics and Householders and "'Yankee' Tools in the Garage" for Motorists.

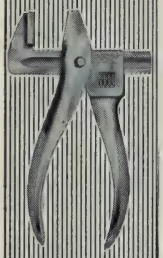
North Bros. Manufacturing Co.

PHILADELPHIA, U.S.A.



Handy Tools

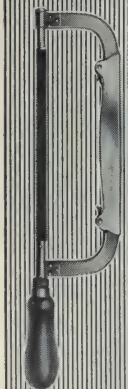
TOOLS for the motorist must first of all be handy tools. There are many bolts that are almost inaccessible for the ordinary wrench but easily reached and turned with the **Starrett Ratchet Wrench.** This consists of a long handle into which fit wrenches of all needed sizes. The ratchet makes turning easy in the most cramped spaces.



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Expansion Pliers

may be used either as a wrench or pliers. The jaws give a grip so powerful that the tool can even be used as a pipe wrench. There are many uses for this tool about the garage or the home.



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cut faster, last longer and do cleaner work than most because of the high quality tungsten steel, the proper set and shape of teeth, the improved methods of manufacture. Starrett Tools include 2100 styles and sizes.

Write for free catalog No. 20-E F.

The L. S. Starrett Co.

"The World's Greatest Tool Makers"

Athol, Mass.

New York London Chicago

TRADE NOTES.

(*Continued from p. XXIII.*)

tools necessary for the work. They also have the bases for trays, baskets, and coasters. At the end of the catalog is a list of the leading books on basketry.

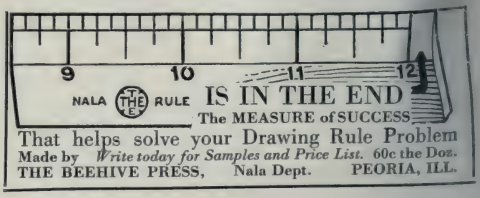
The attention of every ambitous student should be called to the prize offers of the Simonds Manufacturing Co. Under stated conditions 57 prizes will be distributed, one of which is a tool cabinet valued at $30. A wide range of models is permitted, thus enabling boys of varying abilities to compete. For complete details address Department No. 3, Simonds Manufacturing Co., Fitchburg, Mass.

Manual Training Bulletin No. 3, recently distributed by the Oliver Machinery Co., Grand Rapids, Michigan, suggests the completeness of their full line of equipment for the various kinds of schools, and also their ability to serve differing needs. It contains much interesting information. Anyone who has not received a copy would do well to send for it.

To those contemplating the installation of a forge equipment, the Buffalo Forge Co., Buffalo, New York, are offering a valuable service. Their advertisement in this issue sets forth the details.

"Easy-to-Make Furniture" is the alluring title of a book containing 100 designs in furniture, published by Crater & Holt, Grand Rapids, Michigan. A perspective and scale detail of each design is shown.

From Everett Frain, 723 S. Fifth Avenue, Chicago, Illinois, we have just received Catalog No. 2, which covers cooking equipment for schools. It is well organized and fully illustrated. Along with the catalog is a form, giving standardized equipments for classes of varying sizes, using either kerosene, gas or electricity for fuel. A similar form is also adapted to shop equipments.



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At the Massachusetts Institute of Technology the use of the text book ADVANCED MACHINE WORK has doubled the efficiency of the course and reduced the instructors' work one half. 575 Pages, 609 Engravings. Price $3.00

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This book will assist the student to a knowledge of the principles of mechanical drawing and their practical applications.

The treatment of the subject, as presented, will stimulate the interest of the student and will serve a much more useful purpose than does the formal drawing usually taught.

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Loose-leaf problem sheets, 2 cents net each.

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BOOK NOTES

Books News, published by the Manual Arts Press, has been distributed to every reader of this magazine. If your copy failed to reach you, a postal card request will bring one by return mail. It will be mailed gratis to any one interested in keeping in touch with the literature of the manual arts.

As winter approaches some of our Northern friends will be glad to learn of a little book on *Ice Boating,* edited by Herbert L. Stone and published by Outing Publishing Co., New York. It contains drawings and descriptive details of ice boats by the foremost authorities in America.

Anyone looking for inexpensive examples of classical forms in architecture will be interested in *The Orders of Architecture,* by A. Benton Greenberg, just published by John Wiley & Sons. This is a manual intended to supplement *Architectural Drawing,* by the same author, but it can be used independent of this book. The price is 50 cents.

Progressive Exercises in Typography, by Ralph A. Loomis, of the William L. Dickinson High School of Jersey City, has just been issued by the Taylor-Holden Company of Springfield, Mass. It is intended for use as a textbook in school print shops and as a primer for apprentices. The book contains many examples of such work as is appropriate for elementary classes. The entire book is an example of fine printing.

Teachers who are looking for an inexpensive book on the history of building to place in the hands of students for a textbook or for supplementary reading will do well to examine *The Story of the Art of Building,* by P. Leslie Waterhouse (D. Appleton & Co., 35 cents), and *Famous Buildings,* a primer of architecture, by Charles L. Barstow, (The Century Co., 60 cents.)

Many teachers have wanted separate prints of drawings appearing in the Shop Notes and Problems Department of this magazine. They have been unwilling to destroy their copy of the magazine to get such prints and they have wanted more than one copy. Now they can do as one supervisor did: he purchased the set of the tracings known as *Shop Problems,* by Albert F. Siepert, and made 75 blueprints of each to send to his teachers thruout the city. Another supervisor has said of these tracings, "This is the best group of practical problems that we have seen grouped in a single collection. We are also highly pleased with the manner in which they are put up." Of course it would not be possible to sell this collection for 25 cents if it were not for the fact that the engravings are the ones first used as illustrations in the magazine."

The Department of Industrial Education of the Oregon Agricultural College has prepared and sent out to teachers enrolled in the state reading circle a list of questions on Professor Crawshaw's *Manual Arts for Vocational Ends,* recently adopted as a reading circle book in that State. This list has been prepared by Professor Frank H. Shepherd. The following questions in Chapters I. and II. suggest the character of these questions:

"1. With the definition of education as a basis, justfy the teaching of manual arts in our public schools.

2. Prove that the teaching of manual arts is needed in public schools for (a) cultural value, (b) disciplinary value, (c) industrial activity.

3. By reference to the theories and practices of great leaders in educational fields make an historical setting for the industrial arts. See also Chapter V.

4. Show that the industrial arts in our public schools may coordinate with the industrial life of society.

5. Discuss "universal education" from the viewpoint of (a) the individual, (b) society.

6. The present trend is toward industrial education. Show that manual training in our public schools has an educational as well as an industrial value.

7. Discuss the limitations of industrial education in teaching manual training."

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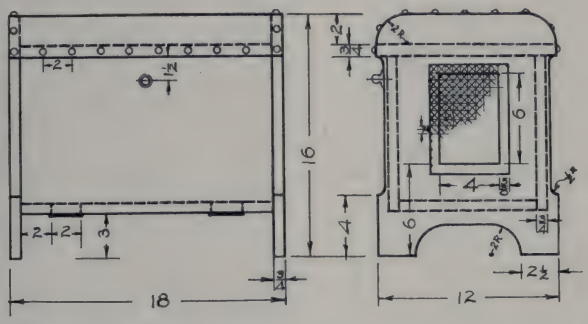
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Shop Problems by Albert F. Siepert, is a new departure in helps for teachers of the manual arts. It is a portfolio of plates, working drawings of projects printed on tracing paper and adapted to be blue printed for students' use. The plates are taken from the Shop Notes and Problems department of "Manual Training and Vocational Education" of the past volume.

The problems include a wide variety; many until published in the magazine were entirely new and all are of good design. There are thirty projects varying from a simple tray to an extension dining table. The list includes the following:

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AFTER HOURS

MY friend Harrington has a mild way of putting a question sometimes which is ther startling. The other day he said to me, have wondered whether you have ever tried formulate the purpose you have in writing it After Hours Department of your magazine. ıave been reading it from the start, but I fail see what you are up to. You have given us ne interesting antiques, and a few ideas that : more modern, but just what your purpose y be I have not clearly seen."

recognized by the modulation of his voice t I was the victim of one of his side thrusts, I didn't want to tell him that I hadn't any mulated purpose, and so I formulated one tanter. I said, "My purpose is merely to use myself, and share that amusement in a pitable way with my friends. It's just the ne as you do when I drop in to see you in the ning. You thrust upon me a new section of)r philosophy of life, and all the old stories you 'e collected since last we met. You take it granted that I will enjoy what you have oyed, and you enjoy sharing the enjoyment h me."

Yes, I see," said Harrington, "You admit that ; department is merely a piece of selfishness— s for your own special pleasure. It relieves r feelings." "In other words," said I, "my atest pleasure is in thinking that I have red my pleasure with my friends. And you losophers say that is selfishness."

Apparently it was time to change the subject, l Harrington led the way: "Do you know, ave been thinking again about that art ques- ı you often bring up, and this is the way my ıghts have run:

DEFINITION OF ART.

look at a chair—a kitchen chair, one of thousands made each year in a great factory. ın sit on it; it will hold me up. It is a chair. ook at another chair, and involuntarily I say, is a beauty. It is a work of art.' I can sit this one also. It will hold me up. Its con- ction and the proportioning of its parts suggest strength; its contour, its color, its finish and its skilfully subdued decoration give me joy. It is a chair, *plus* something we call art. It is this 'something' that gives me joy.

But what is this 'something' that gives me joy? Is it merely material, or does the spirit of the maker hover about it? Whence comes it? If William Morris has given us the secret, it is the joy of the maker expressed thru the chair. It is the kind of joy we all feel in putting gratuitous effort into the making of a thing because we love to—because it helps us to give fuller expression to our ideal. Realizing our nobler aspirations always gives us joy."

Harrington's interpretation of the Morris' definition reminded me of a story once told by President Frost of Berea College which seems to show still more clearly the relation of art to the common things of life and to human aspiration:—

A little girl in a sewing class in a Southern school completed the apron that had been assigned as a problem by the teacher, but she was not satisfied. She came timidly up to the teacher and said, "Please, teacher may I put a pocket in my apron?"

"Why, yes, Jennie, if you want to you may put a pocket in your apron," said the teacher. With joy the little girl went back to her seat and carefully sewed a pocket on her apron; but still she was not satisfied.

Again she came slowly and hesitatingly up to her teacher when no one was near her, and with feeling in her voice, she said, almost beseechingly, "Please, teacher, may I put a ruffle on the bottom?" An apron plus!—plus joy expressed in realizing an ideal.

And this girl was not a genius. Her aspiration is our common inheritance. The germ of art has been planted in every human being.

The new humanities in education must recognize art. We recall Dean Butler's definition: "Culture is a sympathetic appreciation of the finer things of life—literature, art, music, courtesy and religion."

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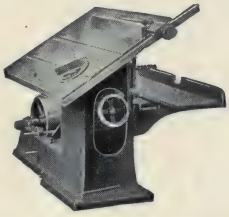
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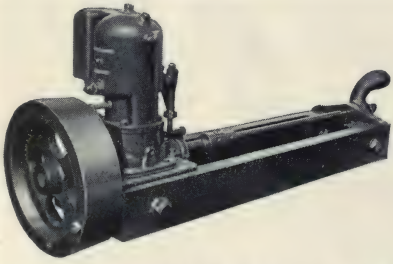


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VOLUME XVII NUMBER 5

MANUAL TRAINING AND VOCATIONAL EDUCATION

JANUARY, 1916.

THE APPLICATION OF PRODUCTIVE WORKSHOP METHODS TO THE PURPOSES OF MANUAL TRAINING.

ARTHUR W. RICHARDS.

THE process of industrializing and vocationalizing education is very much charged with experimental activity. In the field of the practical arts this is particularly so. These experiments are quite entirely bent upon applying the subject matter and methods of the commercially productive workshops of industry to school shops, whether these be strictly vocational, prevocational, or manual training in purpose.

Why the subject matter and methods of commercial shops should be applied to the strictly vocational shops of our schools is perfectly clear. To what extent these should be applied to prevocational schools is less clear, chiefly because the function and status of these schools are as yet, less clear. Why commercial shop matter and methods should find any place at all in our manual training shop practices would seem a still greater question and demand some demonstration if it is to be accepted.

Experimentation is, doubtless, an excellent method for demonstrating some things which mere academic discussion would bring to no acceptable conclusion. Some of the latest experiments which have been made public in the direction of applying workshop methods of productive industry to school shop practice have been made under such captions as "The use of Jigs," and "Factory Methods."

Now jig work in productive industry is simply a *method* of doing work. Factory methods generally connote quantitative production.

Whatever the caption, therefore, it means the same thing, i. e., quantitative production, with its subdivsion of labor, organized team work, more or less machinery, and special tools and jigs, designed to abridge hand tool work. All these are characteristic of modern factory production.

All of these, it would seem, are, as they always have been understood to be, directly antagonistic to the fundamental principles and practice of manual training. Probably no amount of verbal argument would undermine the theoretical foundations upon which this antagonism rests.

With something more than a suspicion that the strict logic of the manual training idea, like the strict logic of many a good human thing, was an obstruction to the vision of what was real and vital in manual training relationships, the writer, some ten years ago made the experiment reported below. This report is offered at this time for what it may contribute to the discussion which has lately been given to the general question of industrialized manual training practices. It is presented in abstract form, just as it was reported at the time, to facilitate analysis.

AN EXPERIMENT IN PRODUCTIVE WORK IN THE ETHICAL CULTURE SCHOOL.

I. The object of the experiment.

1. To get some needed work done.
2. To test some of our boys as producers.
3. To gage the economy of school boy productive work.
4. To gage the possibilities of establishing productive work in school for the peculiar experience and training it offers.
5. To give the boys employed in this particular case the experience.

II. The conditions.

1. A quantity of work suitable for the application of factory methods, which had gotten ahead of the school carpenter.
2. A ten-days' vacation.
3. Boys needing an opportunity to work, earn a bit of money, and get a change of occupation from their school book work.

III. The arrangements.

1. Boys were chosen who had already shown a readiness to be of service to the school.
2. The understanding with them was that it was a business proposition, as strictly so as tho they were going to work for a stranger in a down-town business establishment.

3. The boys were expected to produce a substantial quantity of work of market quality.

4. Working days and hours were on a business basis, as arranged with each worker.

5. As the boys had no standing as workmen, the rate of pay was to be determined by what they accomplished, and estimated by a conference of those having to do with such work.

6. It was understood that any boy proving unsatisfactory as a workman would be discharged.

IV. Direction and supervision of the work.

1. One job—46 bench-hooks—was taken as an introduction to, and an illustration of productive process work, all of the boys cooperating on this job. This job was used to give instruction in the use of the saw table for straight work, and jig and gage work; the use of the planer; drilling by machinery; laying out a job, and keeping it in economical order; and, in general, how to keep things moving.

2. Then, one at a time in order to avoid conflicts in using machines, each boy was given charge of a particular job. This called for continual thought and consideration for each other in adjusting the work to avoid waste of time waiting for machines.

3. Boys getting thru with a job, or being compelled to wait, would assist on some other of the larger jobs that we wished to assure being done.

4. Job cards were given each boy for each job he worked on, upon which he charged his time for that job.

V. Results.

1. The practical product.

46 Bench-hooks.
12 Saw-horses.
12 Boxes, carefully hand smoothed and finished, and covers fitted.
18 Shaped blocks, for carving. Machine work.
54 Stock-boxes, for supply case.
11 Benches slotted for saws; 30 old saw racks removed; the saws changed.
2 Saw-rack boards, finished and put up; the wall plugged for one; both bored and fitted with pegs.
40 Vise-handles cut off, bored; washers cut for half of them; some screwed on.

2. Economic results.

Time Record of Boys

Job	Boys 1	2	3	4	Job Hours	Job Cost	School Estimate	Carpenter Equivalent Hours
46 Bench-hooks	3½	3	7	7	20	$3.69	$5.00	18
12 Saw-horses	25		9¼		34	6.87	7.50	27
12 Box-covers		21			21	3.78	2.50	9
18 Blocks			4/05		4/05	.82	.60	2
54 Stock-boxes			12½	10	22½	3.98	5.00	18
2 Saw-racks		3½		5	8½	1.38	1.25	4½
Back Saw Fixed			5		5	1.00	2.00	7
Vise Handles	5				5	1.00		3½
Hours each boy worked	33½	27½	37¾	22	120¾			
Rate per hour	20c	18c	20c	15c				
Amount paid each	$6.70	$4.95	$7.58	$3.30				
Totals						$22.53	$24.85	89

Time eqivalent figured on rate paid to school carpenter, 28 cents per hour. The rate paid the boys was an estimate based on observation of them at work. It seemed fair after learning carpenter's estimate.

3. Educational Results.

1. A distinct personal consciousness of power and achievement gained, that was a great satisfaction to the boys, and which carried over into other shopwork.
2. A clearer sense of the relation of order, system, plan, steadiness, and effort to real satisfaction.
3. The boys gained a real measure of themselves as useful workmen, objectively, and in terms of market value wage.
4. The boys gained a greatly increased sense of the significance of spoiling material, and wasting time, by the change in the basis of the work from the school to the business and economic.
5. The boys gained a greatly increased insight into the economic and industrial significance of the machine as a tool, in addition to the definite knowledge of using the machine effectively.
6. The boys experienced a peculiar relation with the school in receiving cash payment for their work, which I consider significant under this heading.

VI. Comments.

1. The experiment was a success from all points of view, and gives some light on the possibilities of this sort of experience for educational purposes.

2. The results mentioned as gained by the boys, seem to have value and force of a distinct kind from that which comes from the regular manual training shopwork, where each step requires new adjustments, and as a general thing, where the work is done almost entirely with hand tools, under the control of conventional pedagogic rather than productive or economic motives.

3. The cash payment feature has a school as well as a boy side to it which involves their relation in such a peculiar way as to call for careful consideration.

4. The educational value of such work as mentioned I think impressive enough to justify giving it a place in the regular work of the school at some period, perhaps for one-half year.

5. It suggests possibilities of organizing all the practical productive work in the school, such as special carpenter work, printing, duplicate copy work, and possibly photography, and other lines of school service work, for economic, educational ends, such as are suggested by this experiment. There is no doubt in my mind that in this direction lies perhaps the greatest opportunity the school has to make inapplicable the criticism that our schools do not train for reasonable efficiency in the useful arts of life.

CONCLUSION.

Now what conclusion shall we come to as to what such experiments as the above signify and justify? Obviously the experiments are concerned only with a method, and not particularly with any subject matter taken from the field of productive industry. They represent, therefore, but one phase of an industrialized manual training practice. As a method all who have experimented with it would give it but a limited period of time, and this consideration would be given for the particular object lesson and training in method which it conveys, the regular practices of manual training being recognized as continuing to represent substantial values.

It should be noted that the practises are not advocated for their vocational value in anything but an indirect way. Industrial and vocational are not synonymous in meaning, notwithstanding great pressure has been applied to them by manufacturers of terminology. The factory and productive methods, and the other forms of industrialized manual training mentioned, were advanced for their value as giving a general basis of industrial intelligence and training. What does this

mean? Just the same thing that our prevocational courses in language, mathematics, science, and the like, mean in their relation to the vocations based upon them. It means an intelligence and training which has developed from, and will function, in due measure, in the organized, scientific industry and business of our day. This is the industrial significance of manual training. Manual training is not vocational training, yet it has a vocational significance. This varies from negative to positive according to the connection of manual work taken to the individual's final and actual vocation.

Furthermore, when we examine closely just what was derived from the industrial practices in the experiments referred to in this article, do we not find in these just those results which we care most to have our manual training accomplish? Under "Practical Results" there was produced a conspicuously valuable amount of real serviceable things. Would we not have our manual training give this satisfaction?

Under "Educational Results" we find (1) a distinct personal consciousness of power, which carried over into other work; (2) a clearer sense of the relation of order, system, method, steadiness, and effort to real satisfaction; (3) a real measure of themselves as workmen; (4) a greatly increased sense of the significance of spoiling material and wasting time; and (5) "Insight into the economic and industrial significance of the machine as a tool." All of these we would gladly have as results of our manual training work. Most of them have always been the aim of manual training. One or two are just a bit more modern than its earlier aims, but not at all out of accord with these except by a narrow construction of the function.

We find, therefore, in the application of the factory and productive method to manual training, simply a method of instruction which emphasizes, perhaps magnifies, for a time and so makes impressive some phases of constructive work which are after all elemental and not so much special in their nature as intensified in form or manner. We see, then, something of what manual training becomes and does when industrialized as it has been in several ways. It evidently is a part of industrial education, and no forcing of terminology can dislodge this as a matter of fact and logic. What part of industrial education is it? Clearly the prevocational part. That means that it can and will serve adequately the purpose of establishing by experience and with some definiteness the aptitude of our boys, negatively and positively—one being as important as the other—in respect to the industrial or manual

arts. It will also furnish the experience and training in these which, previous to specific trade training, is necessary to give all the foundation for the special training which can be reasonably expected.

By such practical demonstrations as the kind of experiments considered above represent, it will gradually appear that on account of its economic and functional position in the school system our manual training system can best provide for the prevocational interest of industrial education.

> ONE THING THOUGH IS CERTAIN: PLEASURE IN WORK WILL ONLY GROW WHERE THE WORK WE HAVE TO DO SATISFIES OUR CAPABILITIES, INCLINATIONS, AND TEMPERAMENTS; PERHAPS EVEN THE EXPECTATIONS WE FORM OF LIFE ITSELF. * * * NOT ONLY THE WHOLE ENVIRONMENT IN WHICH THEY (THE CHILDREN) DEVELOP, NOT ONLY THE FUTURE INTO WHICH THEY WILL GROW, BUT ALSO THE NATURAL TEMPERAMENTS AND INCLINATIONS OF MOST CHILDREN, HAVE A BIAS IN THE DIRECTION OF PRACTICAL WORK. * * * NOT ALL WORK BRINGS PLEASURE WITH IT. SUCH PLEASURE ONLY ARISES FROM THORO, HONEST WORK, THAT HAS BEEN THOUGHT OUT FROM EVERY SIDE, SYSTEMATICALLY ADVANCING WITH THE WORKER'S POWERS, AND HIS SLOWLY DEVELOPING PRACTICAL INSTINCTS.—Dr. Georg Kerschensteiner.

HOW CAN THE FACULTY OF THE SMALL HIGH SCHOOL ESTABLISH A VOCATIONAL GUIDANCE SYSTEM?

WILLIAM G. BATE.

VOCATIONAL guidance has come to claim the attention of a large number of schools in the past few years, but as yet practical methods in planning the attack on the problem are in the making. In city schools, systems of vocational guidance have been carried on thru special agencies formed for that purpose. There exists a proportionate need for some agency in the smaller school. While there probably does not exist in the smaller cities and towns, of about ten thousand population or less, the crying need found in the larger manufacturing cities, it is to be recognized that vocational guidance presents to any school not only the opportunity for holding the child in school, which every system must cope with, but also the opportunity for making the school course of practical value in securing a better ultimate adjustment to life work. This alone makes some system of vocational counseling not only desirable but the duty of every school.

In the typical small system, there is perhaps little possibility of creating special agencies for this work, hence the necessity of its being done by existing agencies. In the final analysis this means that any attempt at a system of vocational guidance will devolve upon the principal of the high school and his teachers, and it is probably best so. To add this burden to the already heavily loaded faculty sometimes seems an impossibility. However there is little doubt that a great deal may be accomplished if the people concerned will set about it. The following paragraphs are based on a little over one year's experience of the teachers of Mankato high school. We have four hundred and fifty pupils in the four upper grades of the system, with two hundred and fifty in the seventh and eighth years who are incorporated with the others in the six-and-six plan. At the beginning of the school year 1914-15, the teachers decided to investigate the possibility of establishing a system of vocational guidance that would be feasible and also bring results.

THE PRELIMINARY INVESTIGATION

In approaching the problem to be worked out, the first fact to be determined is the need for vocational guidance in the particular school under consideration, and what character this guidance system shall take. In order to determine this it is obvious that some sort of survey shall be made, for a system designed to meet supposed needs offers no certainty of really answering the needs as they exist. Hence the need for a survey as exact and comprehensive as is possible. The teachers in Mankato set about this task in the following manner. A committee of the teachers consisting of five ward principals and four high school teachers, with the principal of the high school as chairman, was appointed to plan the work and carry it out. The committee immediately saw that with no financial suport all the work must be voluntary. They decided upon a "home-made" survey.

It was determined to find out about three things: (1) The causes for children leaving school before finishing school. (2) The occupational careers of those who left before finishing. (3) The demands of local employers, and how these children are meeting them. From the files of inactive pupils and withdrawals, enough cards were selected at random to give typical cases from each part of the city. The former pupils whose names were on these cards were then looked up and questioned. The ward principals investigated the cases from their particular districts, while the pupils who had dropped from high school were investigated by some of the teachers from that school. All these investigations were carried on out of school hours, and required about three months to complete. The record of all high school graduates was then made, using a survey of some three years previous as a basis and bringing it down to date. In all cases the investigations covered cases for three years back. All investigations were made on regular forms which were mimeographed in the office and placed on file for permanent reference. In the cases of pupils who left school before finishing, the following things were ascertained as far as possible: why they left school; what they did when they first started to work; what they are working at now; what wages they received at the beginning and now. In the cases of graduates, their further training and present occupation were ascertained.

In determining the third fact—how these pupils are meeting the demands of employers—it was decided to make a survey of practically all of the employers of any consequence in the city. This covered over one hundred cases in all. This survey was made by two members of

the committee, and as far as possible thru personal visits. Where the personal call was not possible an attempt was made to get into connection over the telephone or by letter explaining the investigation. With but one or two exceptions it was found that the employers were willing to help us and give any information they could.

SUMMARY OF RESULTS OF INQUIRY

When the survey was completed the results were tabulated and embodied in a report to the superintendent, board of education, and the teachers of the city. The following is a very brief summary of what was found in the survey, and may give some idea of the scope of the work.

Pupils who left school before finishing were asked the following questions: Age at leaving, nationality, parents' occupation, responsibility for leaving—parent or child, reasons for leaving, education since leaving, occupation at starting work, jobs since leaving, average wage. The following are a few of the tabulated results of the investigation.

Reasons for leaving school:

	Pupils who left before 8th year	End of 8th year.	During H. S.
Support selves or aid in support of family.....	40%	22%	11%
Illness	18%	6%	
Wanted training they could not get in high school (before commercial department was established)		13%	18%
Did not like school—would rather go to work—and similar reasons	42%	69%	71%

Occupations of pupils who left:

	Pupils who left below H. S.	During H. S.
Positions holding opportunity for advancement.....	30%	72%
Staying at home	12%	20%
Positions holding out little or no opportunity	58%	8%

Occupations of those who finished high school:

Those in normal school or college courses, or those whose occupations require such training	58%
Engaged in commercial or business pursuits (without further schooling)..	17%
Homemakers (married or staying at home).....	19%
Miscellaneous	6%

Wages received by those who left school before finishing:

Weekly wage	Left below H. S.	During H. S.
$4.00 to $6.00	38%	....
$6.00 to $8.00	22%	10%
$8.00 to $10.00	22%	30%
$10.00 to $12.00	13%	35%
$12.00 to $15.00 and above	5%	25%

Education since leaving school:

	Those who left below H. S.	During H. S.
Some further education	13%	23%
No further education	87%	77%

INVESTIGATION OF EMPLOYERS' DEMANDS AND VOCATIONAL OPPORTUNITY

Employers of the city were asked to give the following information: Do you employ boys or girls under twenty? How many? What do they do? Are those at present employed found deficient? In what? What would you like them trained in? What wages can they earn at beginning? Medium? Maximum? What opportunity is there for advancement in your line of work? What are the chief requisites for a good workman in this line of work? Is the supply of efficient labor large or small?

With very few exceptions these questions were answered freely. Lack of space prevents any extended summary of the facts given, but the answers did not vary greatly from the answers found in similar surveys that have been made elsewhere. One thing was made very plain, and that is that only the poorest jobs and those holding out little opportunity are open to boys and girls under eighteen, or to those who leave before finishing at least a part of their high school course.

The survey completes the first part of the task before a school faculty. In this case it determined the need for some sort of system for guiding and counseling. It also served to give us our bearings as to the direction the work should take. The second part of the task was now to plan this system of guidance work.

A STUDY OF THE PUPILS IN SCHOOL

Thru the questionnaire method we surveyed the pupils of the schools to find out their ambitions along vocational lines, the amount of counsel and aid they were receiving from either the home or school, their

reasons for choosing their courses and vocational aims. It was found, as no doubt would be the case in the typical school, that a great proportion were not doing any special thinking along the line of vocations, and that there was little real direction being exercised either in the home or school. This matter of aim on the part of the pupil seems to be most easily attacked thru two methods: thru the administrative function of counseling as to courses of study, or thru a cooperative effort on the part of all members of the faculty extended thruout the classes of the school. We use both methods.

A system of individual record cards was established, showing pertinent facts about each pupil, his parents and home environment, his course, vocational ambition if any, reasons for both, and studies elected. These cards are filled out for each pupil and filed permanently in the office. They are used by the principal or class adviser when the pupil registers for the year. Here is the information that admits of intelligent counsel in advising the pupil as to his program. Changes of program necessarily made thru the office are also the occasion for use of these cards. At least once during the first few months of the school year, each pupil comes to the office for conference with the principal, at which time the record of the pupil is checked up and the opportunity taken for a heart to heart talk about both course and vocational aim. The results of all conferences are noted on the individual record. When pupils get into difficulty with their work, the individual card is again used in the office. In all these ways, an opportunity is seen to use the individual card and its information about the pupil in regard to vocational ambition and plans. There is no better avenue of approach to the matter of course planning and the necessity of getting certain studies than thru the vocational ambition. The cards are cumulative for six years.

The second way in which this card system is used is thru the cooperation of all members of the faculty. A boy who professes agriculture as his ambition is placed in touch with the agricultural department. The girls who look toward a study of music are reported to the supervisor of that study. The boys who are aiming toward engineering, the trades, or mechanical lines are listed for the instructors in mathematics, drawing, machine work, and carpentry, and so on. In this way the teachers of the different departments are informed as to those pupils upon whom they may have a special influence. Accordingly the teacher who finds it hard to interest a boy or girl in the particular subject being taught may find on the individual record information that will help to get a hold on the pupil and overcome the situation.

Vocational ambition, serious thinking along the line of life career, and the dissemination of vocational knowledge have been stimulated in two ways. The first has been thru the means of talks in general assembly. This was started two years ago when we invited successful local business and professional men to address the student body. The second year, a new series of talks, aiming to cover the general divisions of occupations which would interest our pupils was given by members of the faculty. We found a great many of our teachers who had some intimate knowledge of certain fields of work, while others were able and willing to put special study on their topics. While the intimate knowledge was not so extensive, and perhaps the effect not so great in this connection, when the talks were given by the faculty, it was found that because of an understanding of the idea of the work, and a better acquaintance with an adolescent audience, the instructors were able to give the pupils something more within their power of comprehension.

The second method of arousing interest and stimulating thinking along vocational lines that we have used is the "Grand Rapids plan." Following more or less closely the plan of work developed by Mr. Davis, we have begun a series of vocational guidance compositions for each grade of English.

A third part of our general plan of work has also been a cooperative effort by the teachers. We have assumed that in every course in the curriculum there is a practical value along vocational lines. The plan is that every teacher shall take the opportunity from time to time to point out the value of their courses to the students. In other words, it is an effort to connect up every course with the practical aim, correlating it with the cultural. The aim here is to help the pupil to understand why it will be a good thing for him to have English or German or geometry if he is to succeed in his chosen career. The pupil who does not like or can not get the studies that are essential to his chosen career is being guided as well as the pupil who has no difficulties in this line.

Since the work has been started along the line of vocational guidance, we have reorganized on the basis of the six-and-six plan. Our plan of work now includes the seventh and eighth grades. In the two lower grades, conferences with parents as well as pupils are sought.

CONCLUSIONS

Our experiment has pointed out a few facts to us which have been helpful. The first is that a plan of vocational guidance work is not

only needed in the school, and capable of accomplishing some gratifying results, but that it is an entirely feasible undertaking for the faculty.

Two things are evident, however: (1) the cooperation of all teachers is necessary; (2) vocational guidance work can be extended over a great many different agencies working together. Practically all the administrative work of the plan, together with a great amount of the formal conference work, will necessarily have to ge done by the principal or the class advisers. It is our experience, however, that the vocational purpose gives the easiest approach to the subject and makes for more effective counseling than before.

As far as the teachers are concerned, instead of adding to their burdens, we have found that a new opportunity has been opened up which results in better interest, provides a new aspect of the work, and gives an additional opportunity for informal contact with pupils resulting beneficially both for pupil and teacher.

After a little over a year of trial, we have no doubt about continuing the work. As for actual results, one year is not sufficient to point to many ultimate adjustments, but we do feel that the few we can point to, the cases where we have reason to believe the work has saved pupils from dropping out of school, the better attitude of pupils toward work, increased interest both on the part of ourselves and pupils, and a general stimulation of that school atmosphere which means directed effort, all have more than justified any extra work that may have been necessary. Better relations between school and business men of the city, more free use of our fund of information about pupils by these business men have also resulted. On the whole, we feel that something has been started which will be worth while, and there is no reason why the typical school faculty of the small city cannot establish and carry thru a plan of vocational guidance.

CORRELATION OF DESIGN AND SEWING.

LUA R. CRAWFORD.

WHEN woodworking for boys was introduced into our public schools, its handmaid, mechanical drawing, received instant welcome. The boy, building a piece of furniture, does so, only after he has drawn his plan and elevation. If he receives the finest instruction, he learns that good proportion and fine lines have as much to do with his result as careful cabinet making.

The girls who have been taught sewing in these same schools have not been so fortunate in the happy correlation of drawing with their shopwork. A dress made without definitely worked out design is as bad as the table without its working drawing. In making a dress from a bought pattern, the girl loses the opportunity of using her imagination.

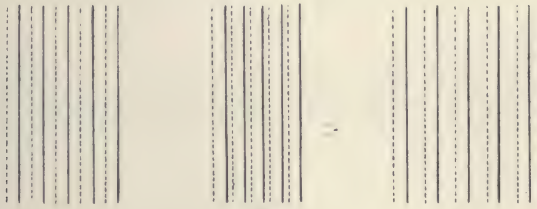


FIG. 1.

We are learning every day that one of the ways to enrich life is to fill it with beauty in the little things. Many teachers of industrial work now realize that one of their prime duties is to lead boys and girls to an appreciation of fine things, so that they will have the desire to always add the element of beauty to their work.

In the household arts course in many high schools, the first year's work in sewing consists of the making of a set of undergarments. These garments may be spoiled in the making by the lack of knowledge and application of good principles of design. In such schools the design of the first year should include the making of plans and sketches for these garments.

Variety of space is one of the first principles of design. Monotony kills. A lesson in the spacing of tucks is a good lesson for the commencing of undergarment design. Fig. 1, A shows a cluster of tucks $\frac{1}{8}''$

wide with $\frac{1}{8}''$ spacing between the tucks. Fig. 1, B shows a cluster of $\frac{1}{8}''$ tucks with $\frac{1}{16}''$ between, and Fig. 1, C shows tucks $\frac{1}{8}''$ wide with a $\frac{3}{16}''$ spacing. Applying our principle of variety, B and C appear more pleasing than A.



FIG. 2.

Free designing of clusters of tucks with lace insertion between the clusters offers further work on tuck spacing, Fig. 2, A and B. Fig. 3 shows that an odd number of tucks in a cluster seems more pleasing than an even one.



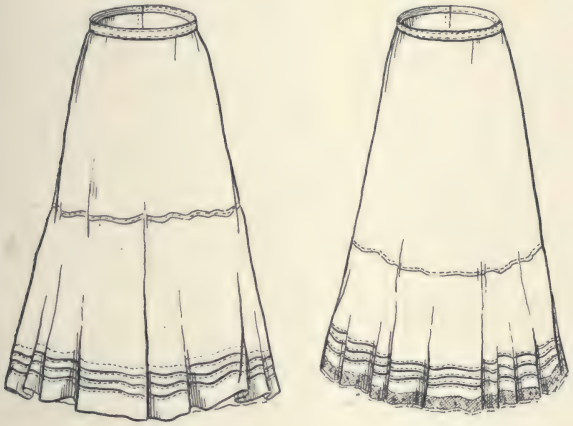
FIG. 3.

Direct application of these lessons in tuck spacing may be made in the planning of a flounce for a petticoat. Before any definite space division can be decided upon for the flounce, the skirt length must be taken, and this length divided into skirt and flounce lengths, so that they are in good proportion to each other.

In Fig. 4, A, the whole petticoat length is divided by the flounce, into equal measurements. Another important principle—*that the decorated portion of anything to be really fine must be of a smaller area than the undecorated part*—is called into play. Thinking in terms of the principle, it is easily shown that B of Fig. 4 is more interesting in its space relations than A. B, also, better suits the individual for the knee is more or less a guide to the height of the flounce.

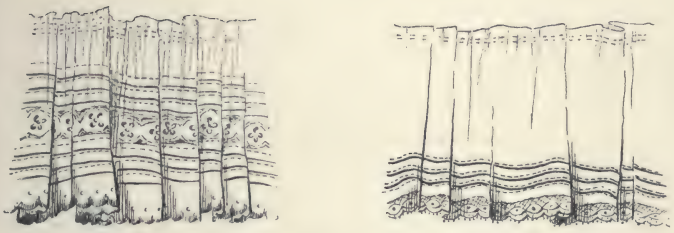
In planning the flounce the same principle should be applied in the relation of decorated to plain space as was used in planning flounce and skirt lengths.

Fig. 5, A, shows an over-decorated flounce which grows very clumsy near the gathers. Fig. 5, B shows a well planned flounce spacing. The plain portion is in good relation to the space decorated and the tuck spaces are pleasing.



A B

FIG. 4.



A B

FIG. 5.

Such a drawing as Fig. 6 worked out in full size, with skirt lengths stated, makes something very tangible for a pupil to work from in the sewing room.

The camisole design planned on the real waist draft or pattern of the girl enlarges and emphasizes the same principles of space planning as

were involved in the petticoat design. Fig. 7 shows such a design which might be worked out full size and used to work from in the sewing room.

Certain restrictions would have to be placed on the style and kind of each garment and then the pupils should be free to design within those limits. This is an absolute necessity if each garment is to afford new problems to the pupil.

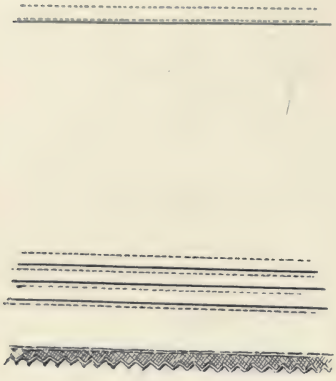


FIG. 6.

The study of laces for undergarments should receive proper attention at this time. They should be studied for their design, texture and appropriateness.

The night gown is an excellent problem for the application of white embroidery. When the gown is to be scalloped around the neck and bottom of sleeves, the pupils should be shown that a scallop, as A, Fig. 8, lacks interest because of the absence of variety of space, bb being of the same width as aa; that B is far more

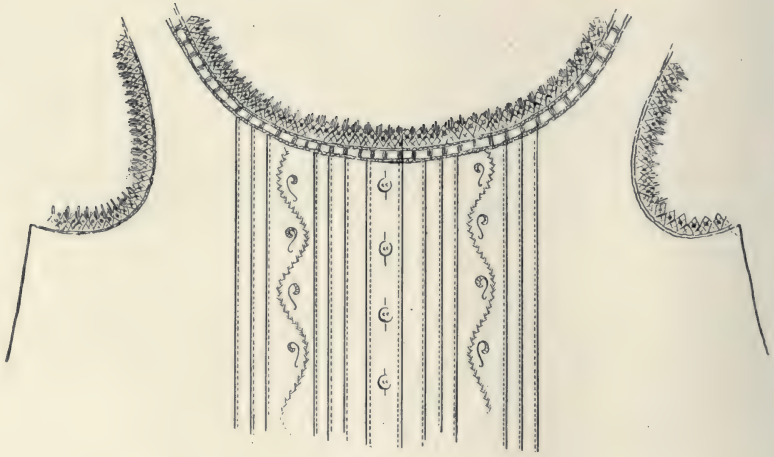


FIG. 7.

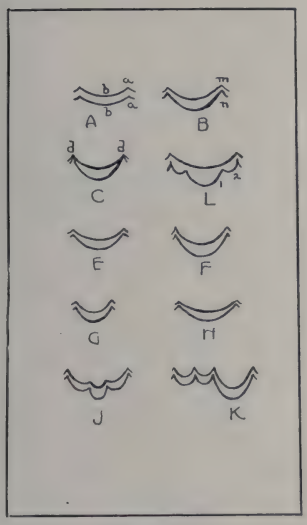


FIG. 8.

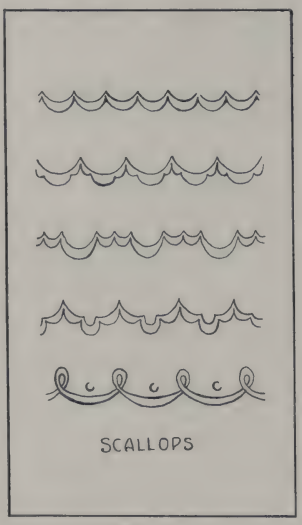


FIG. 9.



FIG. 10.



FIG. 11.

pleasing than A; that C is poor because its points of support dd are weak, thus affording easy places for tearing; and that for sake of symmetry point n should always be under point m as in B.

Scallops may be varied in depth as (E and F, Fig. 8), or in width (G and H). They may be made interesting by varying the bottom line (L), being careful that scallops 1 and 2 are not of the same size; by making scallops within scallops, J, and by alternating different kinds of scallops, K. A page of original scallop spacings, Fig. 9, made by each pupil makes good reference material for future use.



FIG. 12A.

The design applied to the front of the gown, may be made to illustrate good rhythm of line. Before pupils make their designs, it is wise for each one to make a sheet of curves, Fig. 10, and a sheet of motifs, Fig. 11, suitable for white embroidery. These two sheets will also be excellent reference material. If the gown is to have a round yoke, one that is longer in front than on the shoulder, Fig. 12, A, would be more interesting than one whose width is uniform.

A procedure in designing the embroidery would be to place rhythmical curves, showing a common growing point, upon a yoke space, and then enrich these curves with units of interest, *keeping minor things subordinated to a common center of interest*—a third principle of design. In designing, pupils should observe the law of growth—*that the heaviest,*

most important, and most interesting things occur at the heart of the design, and as things decrease in weight and importance, the farther removed they are, from that center, Fig. 12, B.

(The next article of this series will deal with the relation of line to dress.)



FIG. 12B.

PLAYGROUND APPARATUS AS SHOP PROJECTS.

L. J. Mitten.

THE modern teacher of shop work rarely holds to the exercises or models of a generation ago. He is increasingly given to the analysis of new projects and subject matter by means of which he can teach in a more effective and interesting manner the things most vital in constructive work. No longer does the small project of the match-safe, or coat hanger type hold sway, but instead, larger projects, made by the



FIG. 1. A BUSY TIME OF DAY.

joint efforts of groups of boys for the use of others, are becoming common. The boy is taught to think and act in harmony with others in the group or the class while working on projects which become the property of the school or community. He is learning lessons of service and citizenship as well as tool uses.

The boys of the upper grammar grades at Wilmette, Ill., have been making considerable play ground apparatus as a regular line of work in their shop courses. The illustrations and drawings show three of these problems in various stages of construction. Some of the work, such as the making of angle irons, anchor bolts, etc., has been done by a blacksmith, but all work including boring holes, assembling and setting up,



FIG. 2. DIGGING HOLES FOR CONCRETE SWING BASES.



FIG. 3. MIXING CONCRETE FOR THE SWING BASES.

was done by the various classes of boys under supervision of the teacher of manual arts.

The set of six swings shown in the drawings and photographs was worked out by pupils from the sixth, seventh and eighth grades. The frames, 4″x6″ hard pine, were laid out, cut and assembled by the larger boys while smaller boys made six forms, Fig. 7, for casting the tops of



FIG. 4. SWING FRAMES IN PROCESS OF ERECTION.



FIG. 5. BOLTING SWING SUPPORT ON TOP OF FRAME.

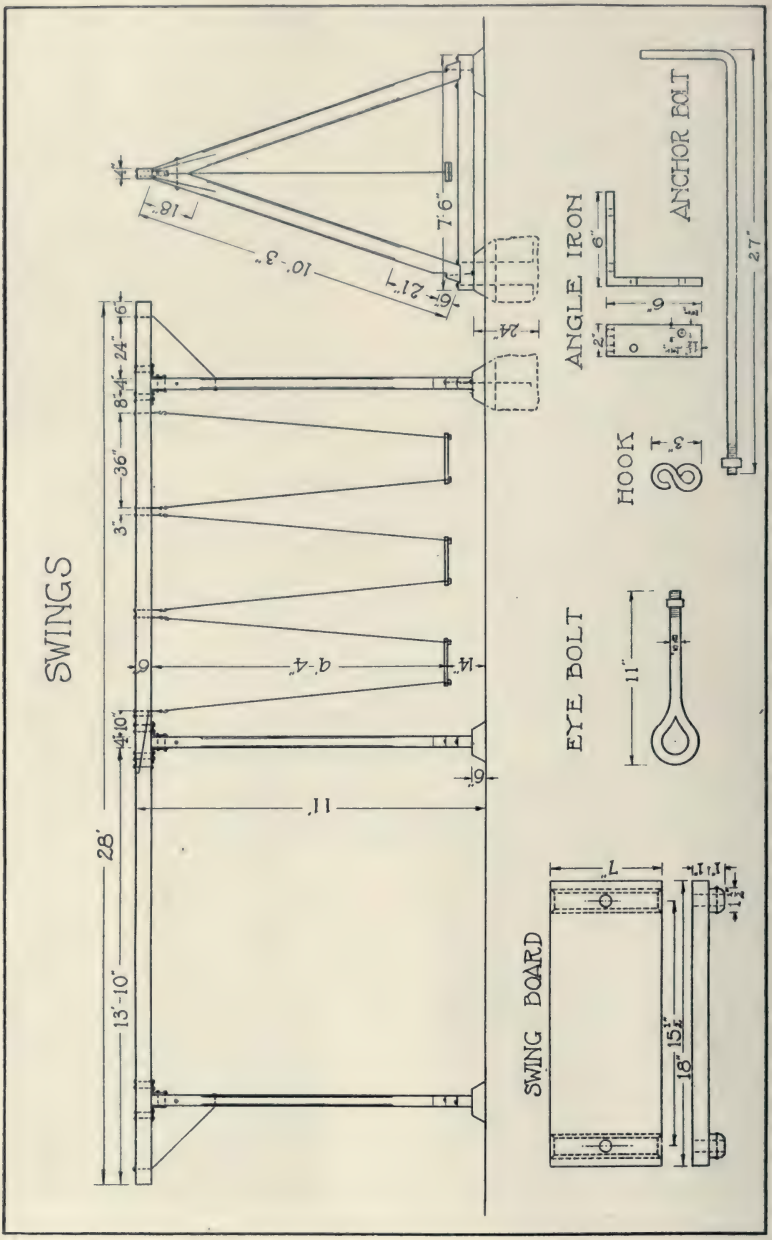

SWINGS
ANGLE IRON
ANCHOR BOLT
HOOK
EYE BOLT
SWING BOARD
28'
13'-10"
11'
7'-6"
10'-3"
21'
18'
24"
36"
24"
6"
4'-4"
14"
11"
27"
18"
15½"

FIG. 6.

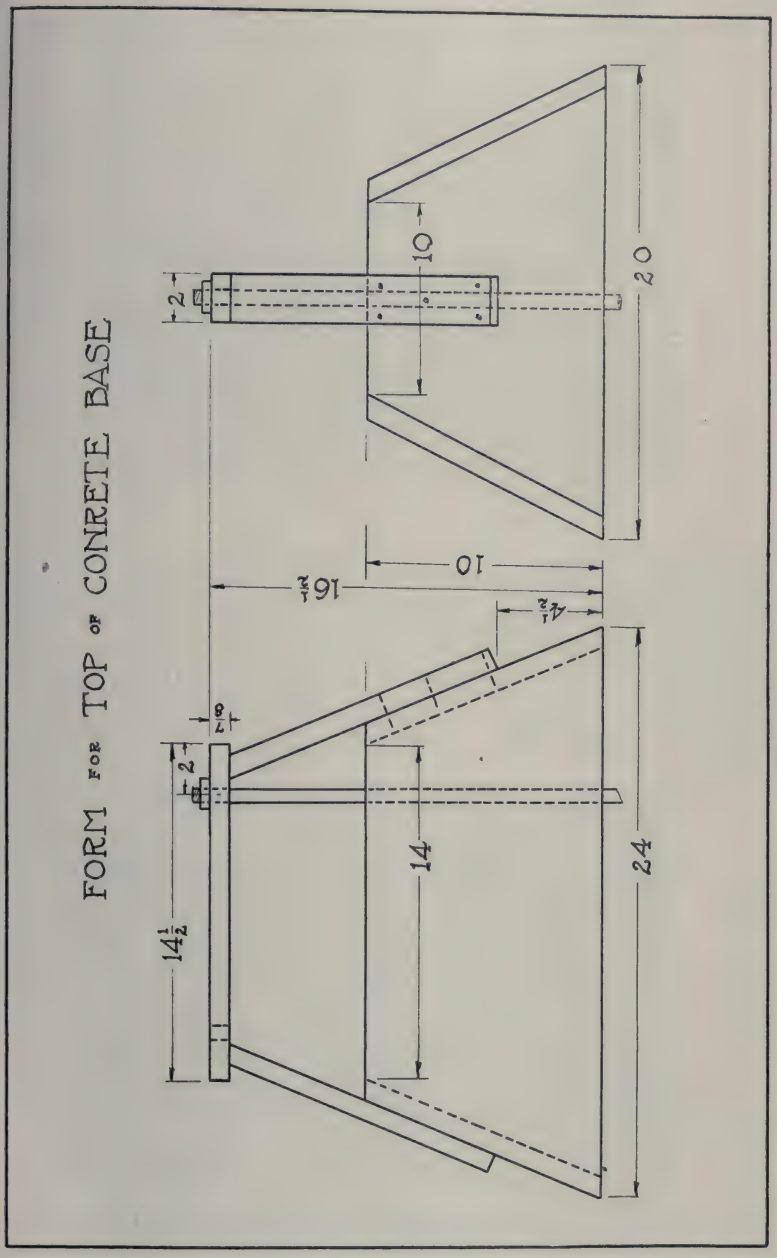


FIG. 7.



FIG. 8. THE SWING IN USE.

the bases on which the forms were to be bolted. Fig. 2 shows the boys digging holes for the swing bases, two of which appear in the foreground. The forms must be placed with considerable care as the tops must be level and exactly the right distance apart. Fig. 3 shows the mixing of concrete while Fig. 4 indicates the first stage of setting up the forms. Fig. 5 illustrates the step of getting the swing support bolted to the frames. The angle irons, eye bolts, hooks and anchor bolts were all



FIG. 9. DIGGING HOLES FOR TEETER-TOTTER BASES.



FIG. 10. ANOTHER GANG AT WORK.

made by a blacksmith, but offer no difficulties to schools having a forge equipment. The hooks and eye bolts should be not less than ½″ in diameter to stand the excessive use demanded of them. The end of the hook is left open far enough to take down the swing whenever that is desirable. The swing proper can be made of either rope or chain; however, the chain swing gives greater satisfaction because it does not twist or knot in wet weather. The completed swings in use are shown in Figs. 8 and 20.



FIG. 11. PIPE HUNG ON FALSE FRAME.

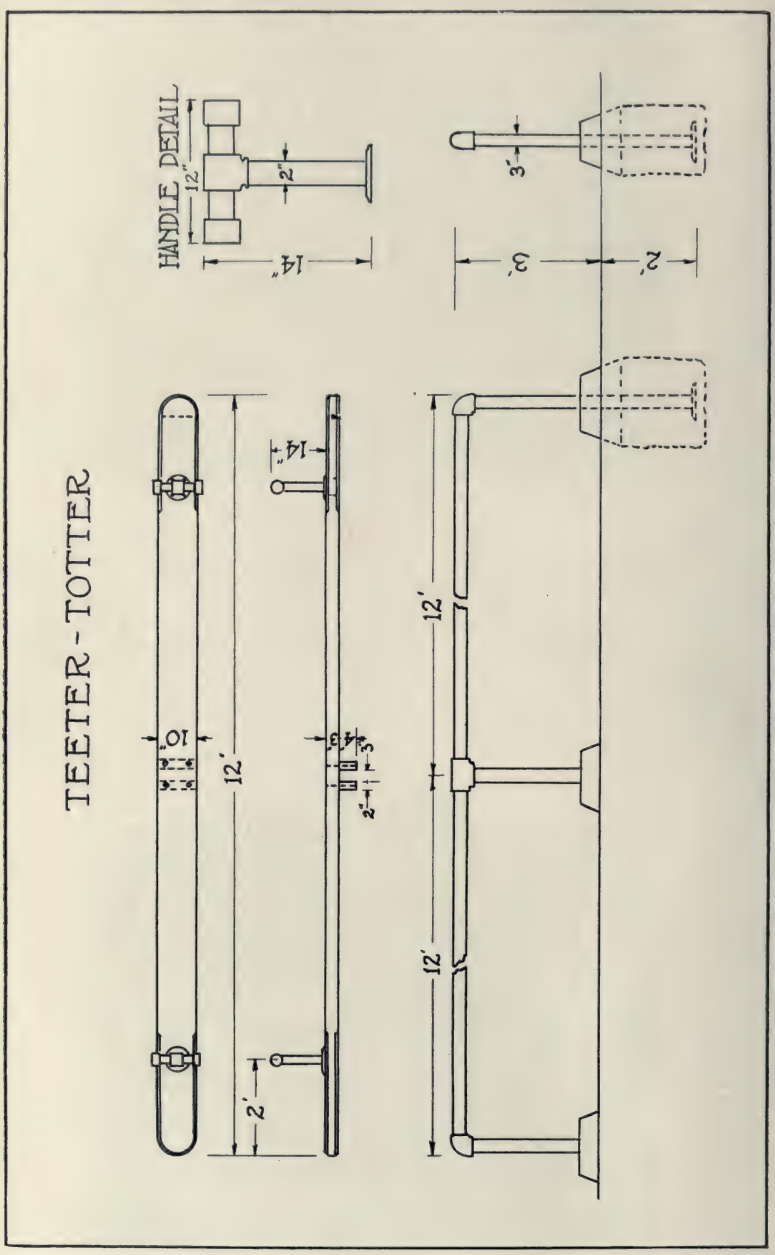


FIG. 12.



FIG. 13. FORMS AND PIPE READY FOR CONCRETE.

The teeter-totter was made by similar classes. The pictures show the style of the work from digging holes for the concrete bases to the completed projects in use by the children.. The material used for the frames was 3″ black iron as that costs less than galvanized. The pieces were brought to the shop cut to required lengths, and threaded. The assembling was done by the boys. A concrete base similar to that made for the swings is used to hold the pipe in proper position. Figs. 11 and



FIG. 14. SOME OF THE WORKMEN.



FIG. 15. WAITING FOR THE CONCRETE TO SET.

13 show a temporary wood frame used to hold the pipes in place until the concrete has been poured into the forms and has had time to set. The teeter boards are made of 3″x10″16′ fir. These are planed smooth, and painted in the school shops by the boys. A ½″ bolt is put thru the plank near each end to prevent splitting. The board is held in place on the pipe by two pieces of 2″x4″ hardwood with a strap across the bottom to prevent anyone from lifting the plank off or carrying it away.



FIG. 16. IN USE.



FIG. 17. FITTING PIPE FOR TURNING BAR.



FIG. 18. BARS HUNG ON FALSE FRAME READY FOR CONCRETE.

The handles are made of $1\frac{1}{2}''$ galvanized iron attached to the wood by means of $\frac{3}{8}''$ bolts.

The third set of photographs showing the erection, testing and use of turning bars illustrate another popular addition to the playground facilities of the schools.

This type of work has been intensely interesting to the boys. They have learned not only something about wood and woodworking tools, but metal work, concrete, etc., as well. They have given their efforts to make the school playground a happier place than it was before and



FIG. 19. FILLING FORMS AROUND PIPE WITH CONCRETE.



FIG. 20. TESTING STRENGTH OF BARS.

so have become public spirited in the sense that they take pride in caring for property owned by the community. It has become evident to those in charge of classes that the boys have learned some lessons of a bigger and better kind than the individually-made small project would ever bring any one of the group.



FIG. 21. COMPLETED BARS AND SWINGS.

INTRODUCTORY PROBLEMS IN MACHINE DRAWING.

—(Continued.)

J. CALVIN NICHOLSON.

NOTHING in mechanical drawing, perhaps, is of greater value than the judicious use of the sectional view in its varied applications and conventions. Plate 7, of course, is only a bare introduction to the subject. The explanatory plate, while not all that is needed, is intended to give in as few words as possible a correct and somewhat easy approach to the subject. It has been hoped that by placing the illustrations and the written matter pertaining to each in close contiguity, there will be some saving both in eye strain and in the mental effort necessary merely to interpret the explanatory material, thus leaving the largest possible amount of the student's mental energy to be used in the actual mastery of the general principles set forth.

It will be found necessary, however, to revert to these principles again and again and to illustrate them now and then by the means of simple objects. A few suitable objects for doing this are almost imperative—to be used judiciously of course, but a means even better than this is to secure from the boys some little investigation of a simple nature outside of class hours. For example, a common wooden spool may easily be procured by all, who when they have first made two views of it freehand may then split in in two with a knife and easily discover for themselves how to make the sectional view. A little class review of these outside efforts will serve to clinch the subject fairly well and enable them to see wherein the plain and sectional views differ. Such an outside effort has, of course, considerably more value both ethically and as a means of learning when undertaken by the boys voluntarily, but rarely perhaps could a class be found in which a sufficient number of boys would be enthusiastic enough to make the effort voluntarily; and where the school policy in such matters will allow it, one should not hesitate to make such work a requirement on the part of all.

It will be noticed that a few of the problems in Plate 7 require to be scaled. These are only for the brighter boys, and scaling, tho not so very difficult, has otherwise been left for a later study. Little perhaps need be said about the selection of problems, since no special difficulties present themselves here as in Plate 6. The problems shown on a half-sheet are to occupy only a half-plate each. Problems 4 and 5 are as

PLATE 7 – Sectional Views

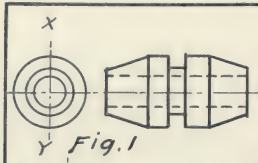


Fig. 1

So far dotted lines have been used to indicate the hidden parts of an object. In Plate 5, for instance, the clutch collar #4 is drawn as in Fig. 1, the two dotted lines in the side view indicating the hole extending thru the object. If instead we imagine the object sawed in two along the line XY, we then have the two halves of the object separate. Removing the right half, we have left the front view of the other half as shown in Fig. 2. Fig. 3 would then be a front and side view of this half. Notice carefully how the side view here differs from that in Fig. 1. Notice that the dotted lines shown are not absolutely necessary now. Being able thus to do away with dotted lines is one great advantage of the sectional view. However, instead of actually removing one half of the front view as in Fig. 3, it is merely imagined as removed while drawing the side view. Also the sectional view is made more clear by drawing oblique lines across the flat surface. Fig. 4 shows the correct method. These section lines are drawn by placing one of the triangles against the T square, usually the 45° triangle.

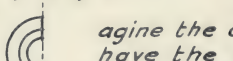
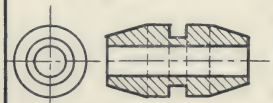
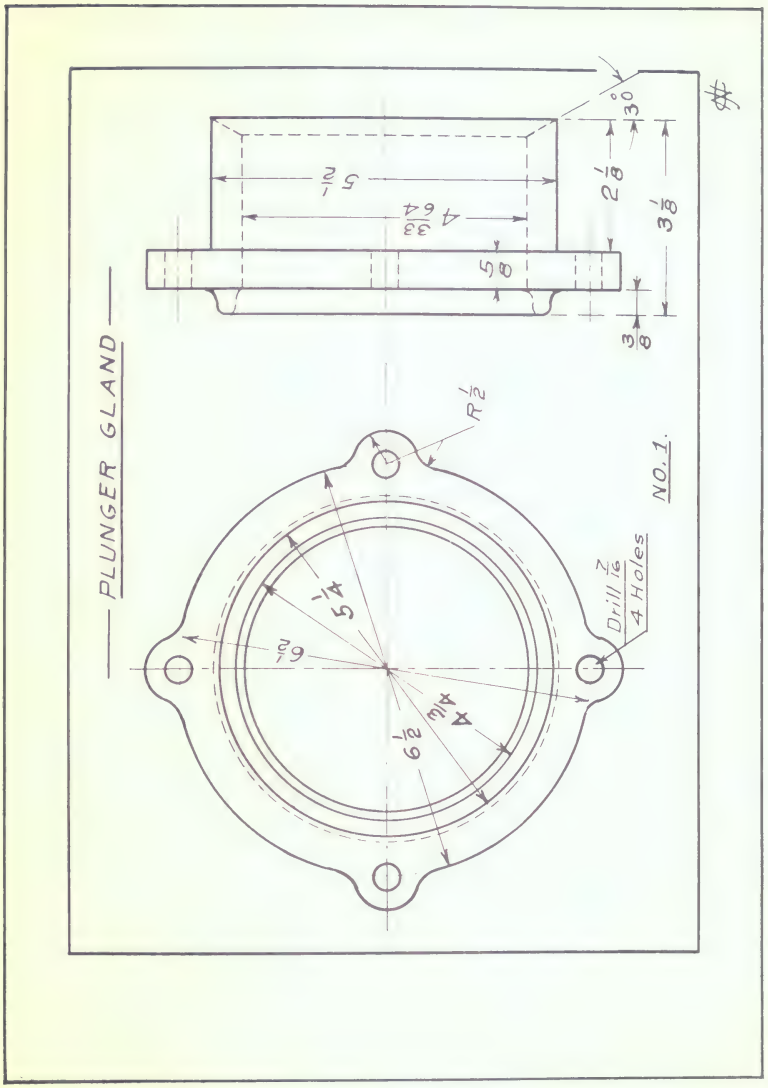
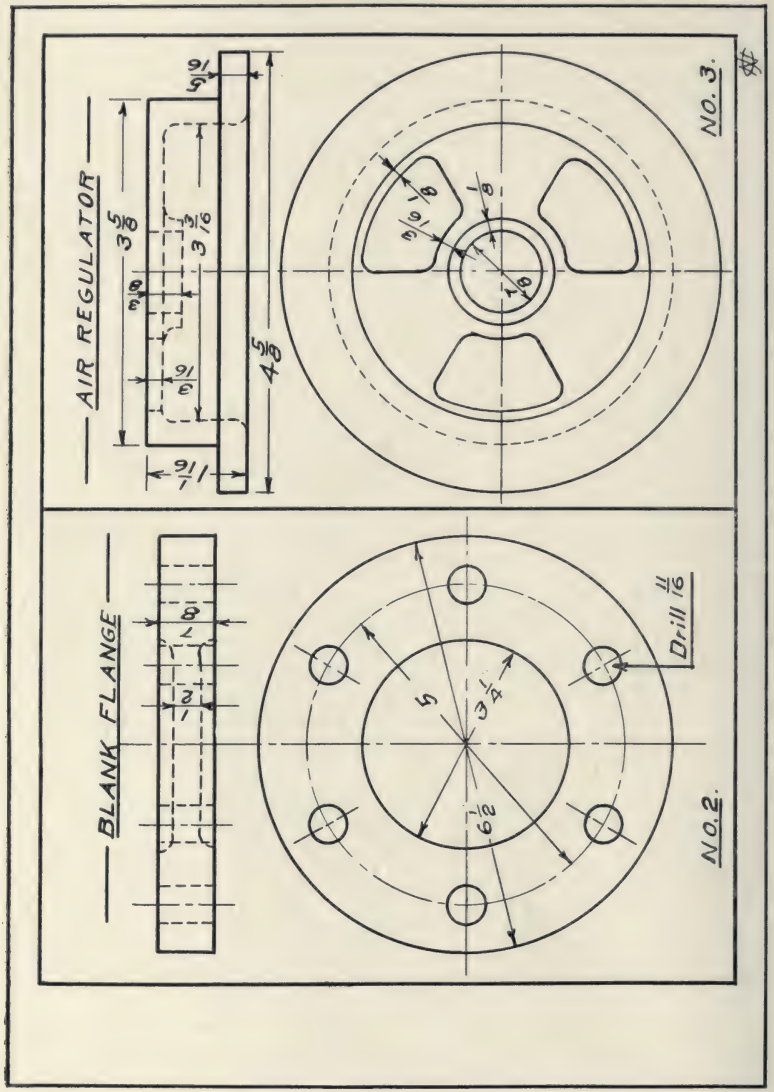

Fig. 2

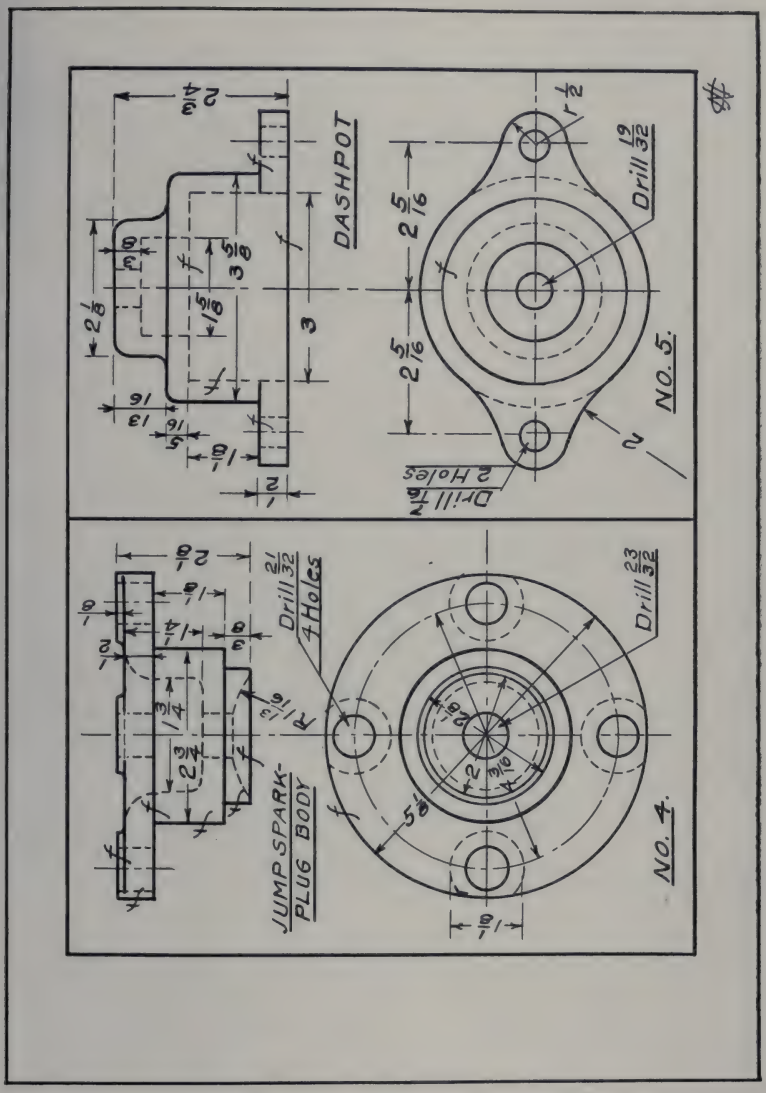

Fig. 3

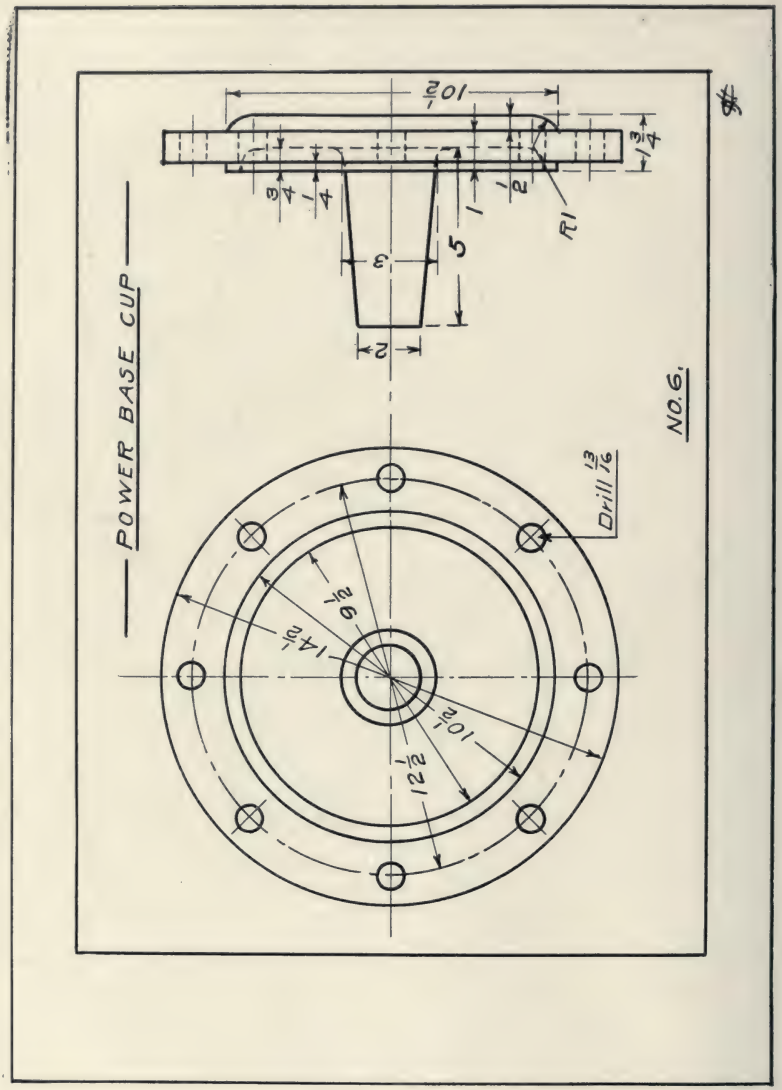

Fig. 4

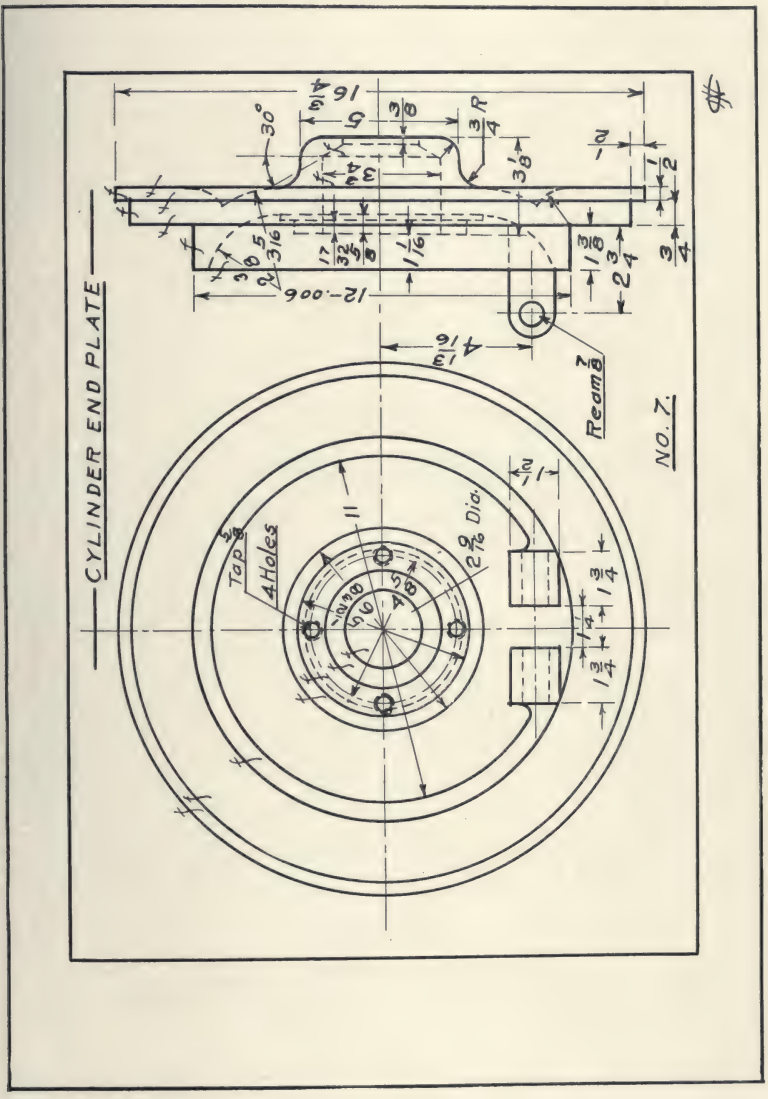
In Plate 7 two views of an object are given by the method used thus far. Copy one of these views and change the other to a sectional view. Section lines are not drawn in pencil, and they are the last lines drawn in ink and are drawn light.

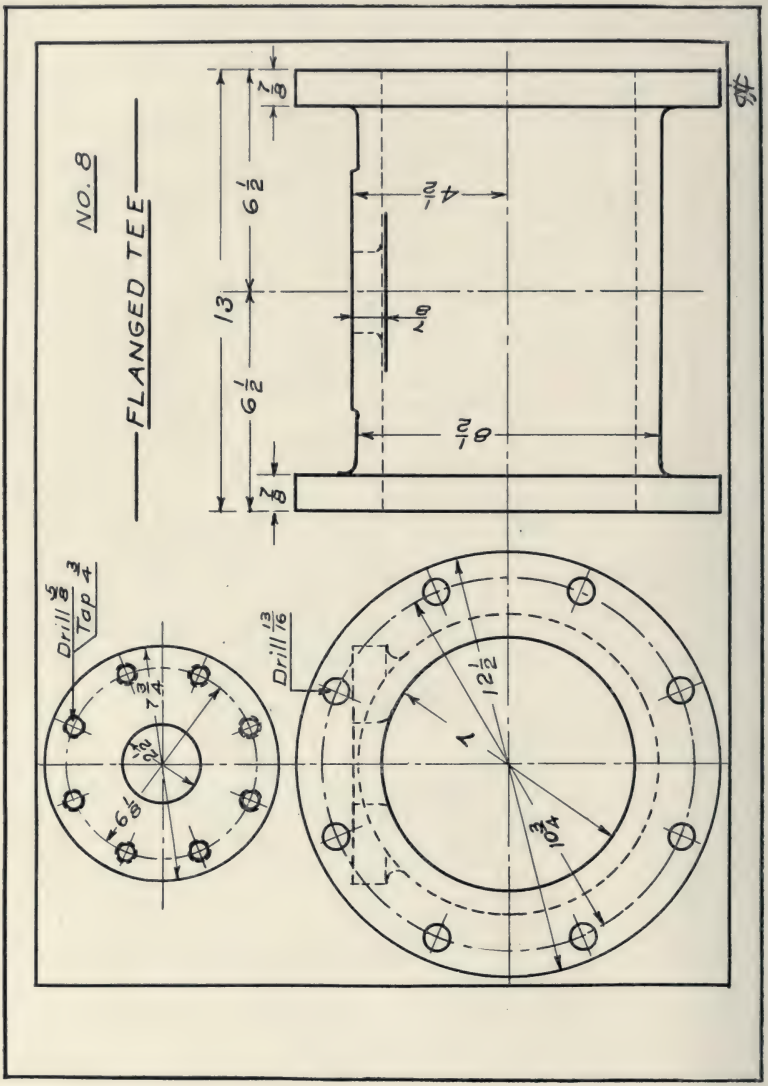

PLUNGER GLAND
NO. 1.
30°
5 1/2
4 33/64
2 1/8
3 1/8
5/8
3/8
R 1/2
5 1/4
6 1/2
4 3/4
2 1/9
Drill 17/32
4 Holes

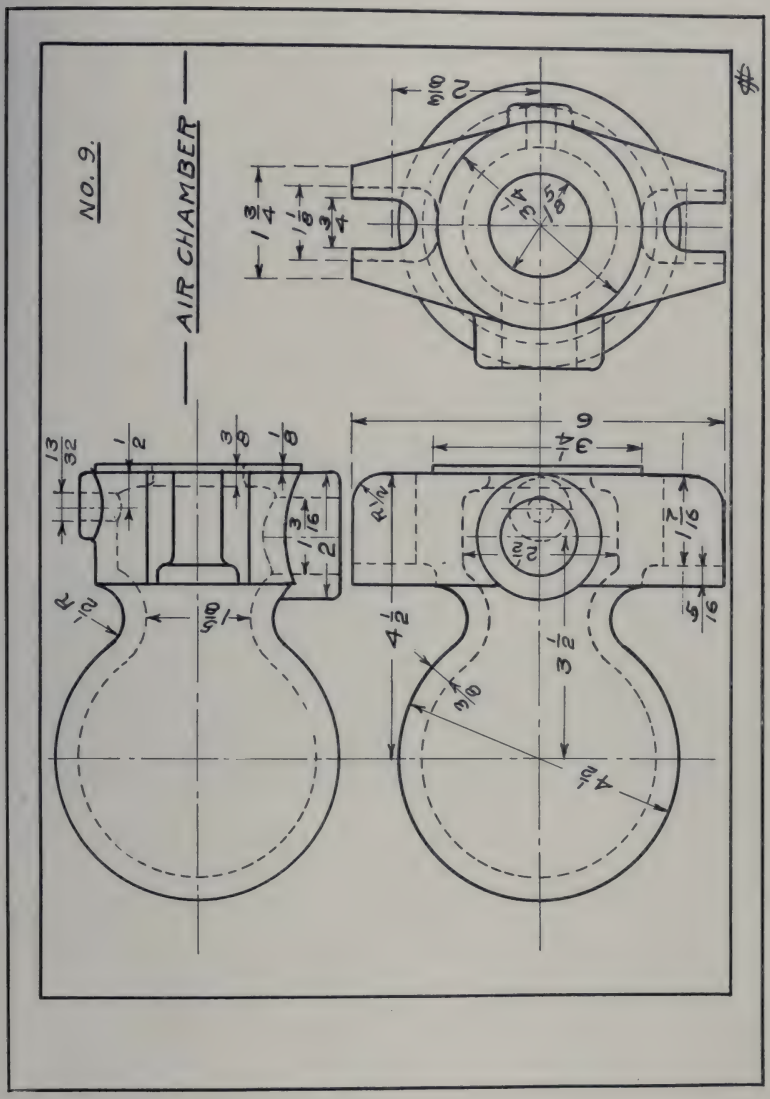

AIR REGULATOR
BLANK FLANGE
NO. 3.
NO. 2.
Drill 11/16


DASHPOT
Drill 12/32
2 Holes
NO. 5.
JUMP SPARK-PLUG BODY
Drill 21/32
4 Holes
Drill 23/32
NO. 4.


POWER BASE CUP
NO. 6.
10½
1¾
¾
¼
1
½
R1
3
5
2
Drill 13/16
9½
14½
10½
12½


CYLINDER END PLATE
NO. 7.
Ream 8
4 Holes
Tap
Dia.


NO. 8
FLANGED TEE
13
6 1/2
6 1/2
7/8
7/8
4 1/2
8 1/2
7/8
Drill 5/8
Tap 3/4
Drill 13/16
12 1/2
10 3/4
7 3/4
2 1/2
9/16


NO. 9.
AIR CHAMBER
2 DIA
1 3/4
1 1/8
3/4
1 1/4 DIA
1 5/8 DIA
6
3 1/4
13/32
1/2
3/8
1/8
1 3/16
2
R 1/2
DIA
4 1/2
3 1/2
3/8
R 1/2
1 1/2
5/16

good as any in the set; they are not altogether easy. Number 2 is the easiest; Number 3 rather hard to execute; Number 1 calls for very careful work and is hard to grasp at the start. Number 6 is rather simple and requires scaling; Numbers 7, 8, and 9 should be reserved for the brighter boys. Number 7 will be found difficult in all that it involves. In Number 8 we have in the top view the convention of making one view show only a part of the object that is generally shown in that view; and in assigning this problem it is necessary, in order to get the drawing on the sheet, to adopt the further convention of drawing only one-half of the flange in the top view. Also the student may be asked to decide for himself whether he will change the front view or the side view to a section. Both of these views are, perhaps, sufficiently clear as they stand. The point is that in making any change to a section, the student should change that view that is least clear in the original. In Number 9 a similar problem presents itself, but here it will be of more importance which view is changed, since changing the top view to a section not only gives a clearer notion of the air chamber proper, but of the two holes leading into it as well. Number 9 also has some approximation curves which, of course, should be explained as such.

Both in Plate 6 and in Plate 7 the greatest care should be demanded in the drawing of all arcs and not a little geometric construction should be mastered as need for it arises. Also, good pencil work has now become absolutely imperative. Especially in Plate 7 it should be required that the entire plate be done in pencil, including the section lines, which should be done freehand. The manner of doing these section lines, moreover, calls for special mention. The prime object with the draftsman, of course, is to help him to avoid making mistakes when he comes to section-line the drawing in ink. But here there is the added value of enabling the instructor to make sure the student has actually solved the problem before he begins to ink it, with a large probability that he may spoil the plate altogether. It follows, therefore, that all the small areas should be clearly and unmistakably section-lined with care, while all the larger areas should have section lines extending a little way in from their boundaries. Of course the work should be done rather rapidly, but the student should understand that it must be neat, nevertheless, and that the lines may not vary greatly in direction and spacing. Finally, in order to make sure of good results it is recommended that when the student is ready to ink the plate, the instructor himself should start the section lining, giving thus the correct spacing and weight of line and explaining how best to preserve this uniformly thruout the plate.

It is doubtful whether a mere rule that has not actually been reproduced in the student's experience is of great value generally, yet it is a slight convenience to beginners to remember that invariably no section-lined surface is ever bounded at any point by a dotted line.

In concluding this series, it should be said that in so short a course some features often found in courses for beginners are here omitted. Scaling, partial sections, and the making of an assembly drawing from the details of a simple mechanism have been left for later work, tho some of the brighter boys will perhaps have done most of these things in working out extra problems provided by the instructor from other sources.



TOOL HOUSE MADE BY STUDENTS IN LYONS, IOWA, W. W. WHITE, INSTRUCTOR.

BIBLIOGRAPHY OF SURVEYS BEARING ON VOCATIONAL EDUCATION.

GEORGE E. MYERS.

THE following list of titles is not complete, but contains the most important studies in this field published prior to October 1st, 1915. It contains, also, titles of a few publications dealing with methods of conducting surveys and with other topics likely to be of interest to the student of surveys.

Surveys which have been made in part or wholly for the purpose of furnishing information bearing on vocational education may be grouped under the following types:

1. School surveys which have made vocational education one of the topics for consideration.
2. Surveys of groups of young workers selected without reference to the industries in which they are engaged.
3. Surveys of particular industries.
4. Vocational education surveys of entire cities.

In addition, much statistical data of value for purposes of vocational education are available from other sources such as the United States census reports, the elimination and retardation statistics of school surveys and school reports, social surveys, and industrial surveys made without reference to education.

SCHOOL SURVEYS.

Not all school surveys have given attention to vocational education. Of those which have done so, some base their recommendations on this subject on the experience and opinions of the survey staff rather than on investigations of local industrial and commercial conditions and needs. The Springfield survey, conducted by Dr. Leonard P. Ayres of the Russell Sage Foundation, is a notable exception. This survey presents important original data on migration among workers as a factor to be considered in proposing a program of vocational education, and on occupational opportunities of the community for boys and girls leaving school, as shown by the occupations of fathers and older brothers and sisters of thirteen-years-old school children. Other school surveys listed

in the bibliography make good use of Census Bureau statistics and of information collected in connection with issuance of employment certificates, but, aside from statements of what the schools are now doing for vocational and prevocational education, they do not present results of first hand investigations.

SURVEYS OF GROUPS OF YOUNG WORKERS.

Surveys of this type obtain data from employment certificate applications, from personal interviews with young workers and their parents, and from employers. The information gathered covers such points as the occupations of children of fourteen to sixteen, or even eighteen years of age, their education prior to entering industry, their age at leaving school, the educational and economic value of these years to the child at work, the economic status of their parents as a factor in removal from school, the attitude of their parents towards the school, etc., etc. The principal function of these surveys has been to focus attention on the needs of vocational and prevocational education, and to make more apparent the industrial scope and the complexity of the problem. They show in striking manner the lack of educative value in employments open to boys and girls under eighteen years of age.

SURVEYS OF PARTICULAR INDUSTRIES.

These surveys have been more numerous than any other type. They include careful analyses of the processes involved in the industries studied, and investigations of the number of employes, sources of supply of labor, present methods of learning the processes, lines of promotion, wages, seasonal character of occupations, ages at which workers are taken on, etc. Each of these studies is limited to a single city or state, but most of the data obtained, except those concerning the number of employes, are of value in any community where the industry flourishes. While made for the purpose of obtaining data which would serve as a basis for a program of vocational education for the particular industries studied, they furnish also much valuable information for the problem of vocational education as a whole.

VOCATIONAL EDUCATION SURVEYS OF CITIES.

The purpose of a survey of this type is to obtain data upon which to base a vocational education program for the city surveyed. Such a survey includes the principal features of the other types of surveys—a

study of what the schools are doing for vocational education, of the education of young workers before going to work, of the processes involved in the principal industries, of the time required to learn these processes, etc. In reality it has not been possible in any survey of this type to include a study of all the occupations of the city. Attention is given to the more highly skilled industries and to those employing the largest number of workers. The Richmond survey, the most comprehensive of the type, is concerned chiefly with 108 occupations in the building trades, the metal trades, the printing trades, and the tobacco industry, in which are employed about 15,000 of the 63,000 workers of the city.

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MADE BY STUDENTS, SANTA MONICA, CALIFORNIA.

PENNSYLVANIA CONTINUATION SCHOOLS.

WALLACE E. HACKETT.

IN view of the fact that the Cox Child Labor Act becomes effective on January 1st, arrangements are being made to establish continuation schools in the school districts of Pennsylvania. All minors between the ages of 14 and 16 years, who have working certificates, except those employed on the farm or in domestic service in private homes, will be required to attend. These schools must be in session the same number of weeks as are the regular schools of the particular district. It will be necessary for each pupil to attend a continuation school eight hours per week. He may be present a period of eight hours on one day each week, or four a day on two days a week, or two hours on four days; or if thought advisable, the instruction may be given continuously, provided the total number of hours of schooling received by these pupils be equivalent to eight hours per week during the school year.

All of the continuation schools must be approved by the State Department of Public Instruction in regard to their location, equipment, courses of study, qualification of teachers and method of instruction.

The schools may be conducted either in the regular school houses or in factories and stores. Many of the larger manufacturers and merchants have fitted out rooms in their establishments as school rooms where instructors from the school department will come to execute the work planned. None of these schools are permitted to be in session on Saturday or Sunday nor are they allowed to open before eight o'clock in the morning or close after five in the afternoon.

STATE AID.

When a school district has fulfilled the regulations of the Department of Public Instruction, that district will receive from the Commonwealth financial assistance as stated in the following schedule:

Each district receives for each teacher of class A for the continuation school, $200.; teacher of class B, $150. Teachers of class A include all those who have had three or more years teaching experience in Pennsylvania; class B includes all those who have had one to three years' teaching experience in Pennsylvania. Teachers of both classes must hold special certificates to teach in the continuation schools.

Each school district also receives fifty per cent of the cost of equipment necessary for the academic work and also fifty per cent of the cost of equipment necessary for the variable vocational work. Fifty per cent is also given to the fixed vocational work.

COURSE OF STUDY.

The time devoted to work in the continuation school will be divided in such a way that forty per cent of it will be given to academic subjects, thus continuating the general education of the child; thirty per cent of the fixed vocational subjects, which are those common to the various industries; and the remaining thirty per cent to the variable vocational subjects; the character of which depends entirely upon the industries of the local community.

The following outline of work has been prepared and sent out by Millard B. King, director of industrial education of the Department of Public Instruction.

ACADEMIC SUBJECTS.

The academic subjects consist of:

(a) English letter writing, spelling of trade names, reading of semi-technical trade articles, writing of compositions on vocational subjects.

(b) Industrial geography—sources and distribution of raw materials, manufacture, transportation and sale of the finished products.

(c) Hygiene for the worker—personal hygiene, community hygiene, safety first.

(d) Civics—relation of employer to employe, local government, state and national government.

FIXED VOCATIONAL SUBJECTS.

The fixed vocational subjects consist of:

(a) Industrial mathematics.

(1) Arithmetic adapted to the industries.

(2) Industrial bookkeeping.

(b) Shop sketching, including freehand drawing and mechanical drawing.

VARIABLE VOCATIONAL SUBJECTS.

The variable vocational subjects consist of:

(a) Study of the machines and the processes at which the pupils are employed during the day. This is to be decided by the local community.

EDITORIAL COMMENT

AT a recent conference of teachers at Rutland, Vt., C. H. Lane, specialist in agricultural education from the U. S. Department of Agriculture startled his audience by declaring that the chief enemy of vocational education was the average teacher. He is reported to have said that "if the apathetic indifference of these stand-pat teachers is ever removed it will mean a glorious rebirth of the idea of vocational education." We suppose Mr. Lane would be willing to include under "average teacher" certain near-sighted school principals and college professors whose academic training has obstructed their vision so that they cannot see that there is possibility of a more truly democratic education that involves vocational training as well as the best elements of the traditional cultural course.

INTERNATIONAL industrial competition and the disclosure of the fact that industrial progress is dependent upon education are the two reasons given for governmental surveys in the bulletin on *Some Foreign Educational Surveys* recently issued by the United States Bureau of Education. This bulletin describes surveys in eleven different foreign countries and points to many facts which will interest survey workers in this country. One difference between the foreign surveys and those being carried on in this country is in the fact that in foreign countries they are made under governmental authority and the findings are therefore conclusive. Another difference, however, is in the fact that they do not reveal local conditions so thoroly as our American surveys. Perhaps sometime we may have a government survey of the surveys which will be a comprehensive piece of work national in character.

THREE stages in industrial education: (1) the beginning stage, (2) the finding stage, (3) the finishing stage. These are the three divisions of a comprehensive scheme of industrial training recently outlined by the committee on course of study for the Indian schools of the United States. The first stage gives elementary general education; the second continues the general education and helps a student to find a vocation suited to his taste and ability; the third fits him more specifically for that vocation. "During the first and second periods the

training in domestic and industrial activities centers around the conditions essential to the improvement and proper maintenance of the home and farm." "In addition to the regular academic subjects boys are required to take practical courses in farming, gardening, dairying, farm carpentry, farm blacksmithing, farm engineering, farm masonry, farm painting, and shoe and harness repairing, and all girls are required to take courses in home cooking, sewing, laundering, nursing, poultry raising and kitchen gardening." "Non-essentials are eliminated. One-half of each day is given to industrial training and the other half to academic studies. All effort is directed toward training Indian boys and girls for efficient and useful lives under the conditions which they must meet after leaving school."

From the standpoint of opportunity for industrial education one might wish he were born an Indian instead of a white man.

THE retirement of Mrs. Ella Flagg Young from the superintendency of the public schools of Chicago and her going to California for rest and an opportunity to do literary work marks another turning point in the life of one who has done a great service to education. We think of Mrs. Young as a school superintendent without a peer in substituting activity for passivity in school work, individual initiative for mere routine, and joyful occupation for indifference and rebellion. Democracy has been pushed ahead another notch thru her service to education.

ON the fourteenth of December Mrs. Elida E. Winchip, assistant professor of domestic economy in charge of the instruction in needlework and dressmaking at Bradley Institute, was stricken with heart failure, and died before she could be removed from the rooms of her department. Her death came as a sudden shock to the students and to her numerous friends, because she had seemed to be in good health. Some of her nearest friends, however, had urged her not to continue teaching her evening classes. The Institute flag at half-mast on the following day only suggested the deep feeling of loss at Bradley Institute.

For seventeen years, or since the beginning of the second year of the Institute, Mrs. Winchip has steadily built up the work of her department until its influence has become far-reaching. Her standard of workmanship was of the highest order, and the many teachers and home makers who have been taught by her have recognized that to her they

owe their success. In personal qualities Mrs. Winchip was a rare woman. Her sympathetic, motherly kindness drew every one toward her. She was extremely unselfish; she was always bearing other people's burdens and forgetting that they were burdens. Giving herself for the good of others became the ruling passion of her life. The home community, the school, the profession will feel the loss keenly and will sympathize with her three children in their greater loss.

BY the will of the late O. S. Johnson, the City of Scranton, Pennsylvania, is to have "a manual training school where boys and girls can be taught such useful arts and trades as may enable them to make an honorable living, and become useful members of society." This school will be under the direction of a self-perpetuating advisory board of five members which has been appointed by Mr. Johnson. The advisory board, according to the will, "shall have the largest discretionary powers in regard to the whole subject, confined only by my direction, that the object of this charity shall be the founding and maintaining of a manual training school." The estate amounts to $1,300,000, and about one-third of the income is now available for the school.

Robert B. Keller, who has been appointed director of the school, is now making a study of the educational needs of the workers in the shops, mines and factories of Scranton and Lackawanna County, and is endeavoring thru correspondence and personal interview to get the benefit of the experience of directors of industrial and trade schools in other cities.

It is encouraging to learn that the advisory board has been wise enough to engage a director before buildings have been constructed and the material equipment fixed, as has sometimes been the case. It is also encouraging to see that the director when appointed, is making a study of educational needs in the industries before indicating the scope and plan of the school.

Scranton is the thirty-eighth largest city in the United States, having a population of 150,000 people. Of this number 30 per cent are of native parentage, 43 per cent are of foreign or mixed parentage, and 27 per cent are foreign born. Of the 52,000 workers in the city, 17,000 are in manufacturing and mechanical industries, and 12,000 in anthracite coal mining. These two facts are sufficient to indicate in general the special field which the school is likely to occupy.

THE MORAL VALUE OF SYSTEMATIC WORK WITH THE HANDS.

WHEN Booker T. Washington died a distinguished American passed out of this life. Newspapers North and South, but especially in the South, spoke sincere words of appreciation of this most distinguished of all negroes.

It is a notable fact that in all the tributes coming to our attention special emphasis has been laid on the efforts of Dr. Washington to develop the economic independence of the colored race. He believed that the surest way to political equality with the white race was thru economic efficiency. These statements remind us of an address once given by Dr. Washington to a New York audience, and how there was a flash of light in his eye as he said that when a negro held a mortgage on a white man's house there was no need to worry about questions of political equality.

While we too would join in pointing to the astonishing progress made by the negro race toward economic independence thru the influence of this man, we would not omit to give special emphasis to the fact that back of his theory of economic independence was a conviction based upon experience which shaped his whole career, and that conviction was that there is unutilized power in handwork to raise moral standards and to quicken intellectual activity. It was because thru experience he had seen the fallacy of the idea "that only to labor with the mind was honorable, while to toil with the hands was unworthy" that he was equipped to discover the solution of the problem which resulted in the demonstration of his theory of economic independence. In his work at Tuskegee he contributed a practical demonstration of what the white man is supposed to have discovered long before, but still needs to make generally effective in education. Indeed it may be doubted whether any white man's school in the United States more fully or efficiently utilizes this fundamental method in education.

We like to re-read the story of Booker T. Washington's early lesson in handwork as he tells it in his *Working with the Hands*—the story in which he reveals how he came to realize the moral value of systematic work with the hands. Many of our readers will recall the story—how there lived a little way from his mother's cabin a woman of wealth who had a high respect for manual labor. She showed that notwithstanding her position and culture she was not ashamed to work with her own hands. She was skilled, and insisted that others in her house-

hold should follow her example. Her standard was so high that she won the reputation among the village boys of being a "hard person to get along with." Half a dozen boys had failed to suit her when Booker Washington's turn came for a trial. With his heart "thumping in fear" he reported for duty to the mansion of this rich and exacting personage.

Then he tells of his first meeting with this woman. It was not as he had expected. She talked in "the kindliest way, and her frank and positive manner was tempered with a rehearsal of the difficulties encountered with the boys" who had preceeded him.

> I saw that it would be my fault if I failed to understand my duties, as she explained them in detail. I would be expected to keep my body clean and my clothes neat, and cleanliness was to be the motto in all my work. She said that all things could be done best by system, and she expected it of me, and that the exact truth at all times, regardless of consequences, was one of the first laws of her household—a law whose violation could never be overlooked.
>
> I remember, too, that she placed special emphasis upon the law of promptness, and said that excuses and explanations could never be taken in the place of results.

He then says that this seemed a pretty stern program; but he began his work. His first task was to cut the grass around the house.

> In those days there were no lawn-mowers, and I had to go down on my knees and cut much of the grass with a little hand-scythe. I soon found that my employer not only wished the grass cut, but also demanded that it be trimmed smooth and even. Anyone who has tried to mow a lawn with a dull hand-scythe, or sickle, can realize the difficulties which beset this labor. I am not ashamed to say that I did not succeed in giving satisfaction the first, or even the second or third time, but at last I made the turf in that yard look as smooth and velvety as if I had been over it with the most improved pattern of lawn-mower. With this achievement my sense of pride and satisfaction began to stir itself and to become a perceptible incentive. I found, however, that cutting grass was not the whole task. Every weed, tuft of dead grass, bit of paper, or scrap of dirt of any kind must be removed, nor did I succeed at the first attempt in pleasing my employer. Many times, when tired and hot with trying to put this yard in order, I was heartsick and discouraged and almost determined to run away and go home to my mother.
>
> But I kept at it and after a few days, as the result of my efforts under the strict oversight of my mistress, we could take pleasure in looking upon a yard where the grass was green, and almost perfect in its smoothness, where the flower beds were trimly kept and the edges of the walks clean cut, and where there was nothing to mar the well-ordered appearance.
>
> When I saw and realized that all this was a creation of by own hands, my whole nature began to change. I felt a self-respect, an encouragement, and a

satisfaction that I had never before enjoyed or thought possible. Above all else, I had acquired a new confidence in my ability actually to do things and to do them well. And more than this, I found myself, thru this experience, getting rid of the idea which had gradually become a part of me, that the head meant everything and the hands little in working endeavor, and that only to labor with the mind was honorable, while to toil with the hands was unworthy and even disgraceful. With this vital growth of realization came the warm and hearty commendation of the good woman who had given me what I consider my first chance to get in touch with the real things of life.

When I recall this experience, I know that then and there my mind was awakened and strengthened. As I began to reap satisfaction from the works of my hands, I found myself planning over night how to gain success in the next day's efforts. I would try to picture the yard as I meant it to look when completed, and laid awake nights trying to decide upon the prettiest curves for the flower beds and the proper width of the walks. I was soon far more absorbed in this work than in filling in my leisure time seeking mischief with the village boys.

Then he adds:

"While I have never wished to underestimate the awakening power of purely mental training, I believe that this visible tangible, contact with nature gave me inspirations and ambitions which could not have come in any other way. I favor the most thorough metal training and the highest development of mind, but I want to see these linked with the common things of the universal life about our doors."

Booker T. Washington learned this not thru books on pedagogy, but thru experience that was so vital to him that it had to become a guiding principle in his life work. In his mind there was no question as to the moral and intellectual value of handwork if done systematically and thoroly, and as he had discovered nothing to take its place, such work must be a fundamental element in his scheme of uplift for the race.

OF CURRENT INTEREST

BUREAU OF EDUCATION CONFERENCE IN CHICAGO.

THIRTY-THREE men were in attendance at the Conference on Industrial Education and the Manual Arts held in Chicago December 9, 10 and 11, under the auspices of the National Bureau of Education. This Conference takes the place of the meeting of a smaller group of men interested in the training of special teachers of the manual arts which was first held a few years ago at Bradley Institute and has since become an annual event. Last year the group met at the University of Chicago and decided to invite the Bureau of Education to take charge of the Conference in the future. Most of the sessions this year were held at the Chicago Teachers College, and all of them were presided over by Dr. William T. Bawden, specialist in industrial education in the Bureau of Education. The headquarters was at the Del Prado Hotel on the Midway, and there the evening sessions were held. Fourteen States, from Pennsylvania to Nebraska and from Texas to Minnesota, were represented in the conference, and almost every man present was the head of a college, university or normal school department which is training special teachers of industrial subjects.

The two chief characteristics of this conference, as of those held in the past, were (a) good fellowship and (b) free discussion. It would be impossible to give the reader an adequate impression of the discussion thru printed statements, but a few outstanding facts may be recorded.

During the first session the discussion centered around the idea of professional progress: first, thru cooperation of the men in the field represented by the Conference; and second, thru a higher type of teaching. In giving emphasis to the importance of professional training Professor Van Deusen of the Kent State Normal School told the story of the oculist who, having recommended a long course of training for a young man desiring to enter his profession, was reminded that he never took such a course himself. The oculist replied, "But my training cost a bushel of eyes." The teachers must be trained merely as a safeguard to society. The Conference seemed to agree that training for teaching should include more observation of expert teaching as well as more practice teaching, or apprentice teaching under competent, sympathetic supervision.

In harmony with the key-note struck at the first session was the presentation of means for testing the results of teaching. The discus-

sion of these was led by Professor Ira S. Griffith of the University of Missouri, and Professor Charles H. Bailey of the Iowa State Teachers College. Mr. Griffith showed in graphic form the results of tests of students in shopwork which would lead to the conclusion that the speedy student is usually the accurate student. He pointed out the fallacy of the slow-but-sure idea and to the desirability of a scale for measuring students' ability in shopwork and mechanical drawing. Mr. Bailey followed with an interesting table of results from a questionary intended to help in deciding upon a standard of grading in mechanical drawing teaching which might reasonably be used in establishing a scale. The most conclusive deduction from the replies received from 30 high school teachers, 5 normal school teachers, 10 engineering college instructors and 11 practical draftsmen was that in marking drawings, much more credit should be given for correctness than for accuracy.

In harmony also with the key-note of the Conference was the report of the committee on evaluation of courses made by Professor Fred D. Crawshaw of the University of Wisconsin. The committee is working on the problem of standardizing certain courses so that credit may be more easily transferred from one institution to another. Outlines were presented in administration of manual arts, history of manual arts in education, architectural drawing, carpentry, wood-turning and several other subjects. A feature of the report was that methods of teaching and the tests employed were given about as much emphasis as the scope of the course and the time given to practice.

A discussion of the possibilities of work in the manual arts and vocational education under the Gary plan brought forth a list of favorable considerations and another of unfavorable. Considerable interest was manifested in the idea of having the younger children of the elementary school observe and participate in productive shopwork as a means of widening their experience with things and processes, but it was pointed out that in the upper grammar and high school grades, when habits for life are being formed, more careful supervision and systematic and thoro instruction than is usually afforded under the Gary plan should be given.

One of the most stimulating topics of discussion in the Conference was concerning the extent to which existing well-equipped manual training departments in cities and towns may meet the demands of vocational education. What would seem to be the results of the discussion may be stated in a few sentences: The manual training work of the schools should be the basis for vocational education in small cities and towns.

The vocational value of such shopwork as is usually called manual training has been proven over and over again thru the success of students when they went out into industry. Both in teaching the manual arts for vocational ends and for cultural ends analysis and organization of subject-matter are essential to real success. There is no essential difference between teaching a manual art for vocational ends and for cultural ends provided the students are of the same age and general intelligence. No school, not even a trade school, should be expected to turn out journeymen without providing experience under actual trade conditions, and such conditions do not as a rule exist even in the best public trade or vocational schools. There is no reason why the high schools cannot adjust themselves to the needs of the industrial training situation, and contribute largely to vocational training. In most small cities and towns the high school can do more toward providing vocational training for the community, and can do it more economically than can a separate school; the high school plan is safer than one involving a separate school.

One of the last topics to be considered was the results of educational surveys in their relation to the manual arts. The discussion seemed to indicate that up to the present time these resuuts have been disappointing and sometimes the reports of surveys have been misleading. The Conference was looking to the Minneapolis survey to furnish more constructive suggestions.

Next year the Conference will meet at the George Peabody College for Teachers at Nashville, Tenn.

THE NATIONAL SOCIETY CONVENTION AT MINNEAPOLIS.

It is expected that manufacturers, educators, labor officials and noted economists to the number of one thousand, will gather in Minneapolis on January 19-22, to attend the annual meeting of the National Society for the Promotion of Industrial Education. The chief interest of the gathering centers around the Minneapolis Vocational Education Survey, which the Society has been conducting since last May, for the purpose of determining just what kinds of industrial training are required to meet the needs of Minneapolis.

One of the most significant topics of the convention will be an address by Dr. George E. Barnett of Johns Hopkins University, Baltimore, Md., on "The Possibilities and Accomplishments of Trade Agreements in Industrial Education." Dr. Barnett, who served as director of some of the investigations for the Commission on Industrial Relations

has made a special study of conciliation and arbitration in labor disputes. Matters which ultimately and vitally concern both the employer and the employe are being dealt with by means of a joint agreement known as the protocol. It is coming to be recognized that in some industries the training of the worker should be as much a matter of trade agreements as hours of labor, scales of wages, grievance boards, etc.

Trade understandings for vocational education have been worked out in several cities, but as a result of the Survey they are planned in a most complete form for Minneapolis in connection with the courses being developed in the Dunwoody Industrial Institute; these trade agreements cover the following:

1. The conditions under which the new workers are to be trained and received into the trade or occupation.
2. The credit toward the period of apprenticeship to be given any course of training in the schools either before or after employment.
3. The training in schools as well as shop to be required of the apprentices after employment.
4. The preference given to local and trained workers in hiring and promoting in the trades and occupations.
5. Possibilities and arrangements for instruction during the dull season periods of the trades.

Problems of industrial education under public administration will be made the subject of a paper by Frank V. Thompson, assistant superintendent of schools, Boston, Mass. How the high school can best adapt itself to serve industrial education will be a live topic to those who feel that the high schools of the country are not doing all that they should for the specific vocational needs of the pupils who attend them.

Arthur D. Dean, director, division of agricultural and industrial education, New York State Department of Education, will tell of the new developments in vocational education in his state, and particularly of that which is being developed in New York City, which is the most extensive of any now being undertaken in any part of the country.

There will be a half day devoted to a number of sectional meetings where details of the Survey will be discussed and where administrative and technical problems which are live issues in the vocational education movement will be taken up, such as: The training of tradesmen for industrial teachers, and how such training is being undertaken in different states and by different institutions; possibilities for industrial training related to the workers in mining communities; shop methods and the utilization of product in girls' trades schools; the training of agricultural

teachers; agricultural training given in the form of home project instruction; what provisions for commercial and shop experience should be made in the training for trade teachers.

The annual banquet night will be Thursday, January 20th, and the speakers will be the following: Hon. John Lind, ex-governor of Minnesota, toastmaster; Hon. William C. Redfield, Secretary of Commerce, Washington, D. C., and president of the National Society for the Promotion of Industrial Education; Hon. W. S. Hammond, governor of Minnesota; Dr. George E. Vincent, president, University of Minnesota; and Mrs. Alice Ames Winter, former president of the Minneapolis Women's Club.

Several important conferences are to be held in connection with the convention. One of these will bring together a group of employment managers; another will consist of state directors of vocational education. There is every reason to believe that the convention will be a notable one.

A VOCATIONAL EDUCATION SOCIETY FORMED IN CALIFORNIA.

In January, 1915, a group of men and women who were interested in vocational education called a meeting of employers, workers and school people at the City Hall, San Francisco; Mr. Clarkson Dye of the Chamber of Commerce presided as temporary chairman, and Mrs. May L. Cheney, Appointment Secretary at the University of California, acted as secretary. Mr. Dye said to those assembled that it seemed to him that the interest in vocational education and occupational guidance was seeking satisfactory expression in that state, and that as bills were pending before the legislature providing for vocational training in the schools, there was every reason for bringing together employers, the representatives of organized labor and the school people in an organization where the question could be exhaustively studied and an agreement reached in regard to the kind of vocational education most needed.

As a result the Society for the Promotion of Vocational Education and Occupational Guidance was formed, the following statement of its objects being incorporated in the constitution:

Objects: The objects of the Society shall be to bring to public attention the aims and needs of vocational education; to provide opportunities for the study and discussion of the various phases of the problem; to make available the results of experience in the field of vocational education both in this country and abroad; to initiate and encourage efforts having for their purpose the leading of individuals into suitable occupations; to encourage surveys of occupations, and the establishment of a clearing-house for information on occupational guidance in the shape of booklets, reports, lectures, courses of instruction, etc.

The early days of the organization coincided with the discussion

before the legislature of the pending bills creating a system of vocational education for the state of California, with a fund of $100,000 to be distributed to schools where local initiative had already provided vocational training of a certain standard. The bill passed both houses, but was pocketed by the Governor because of the lack of money. Endorsements were secured for the measure from the Labor Council and from employers' associations, partly through the efforts of the officers of the Society for the Promotion of Vocational Education and Occupational Guidance.

The meeting of the Vocational Guidance Association in connection with the National Education Association in Oakland in August, 1915, was a source of help and inspiration to the new society. It has not yet entered upon the ambitious program laid down in its constitution. The survey of occupations would have been made by the state, had the vocational education bill become law. Now the people of California must look to private organizations to undertake it, or work for the law again at the next session of the legislature.

Meantime the new society has planned a series of meetings on typical occupations. The first was on the printing trade, the second on office occupations, the third on electrical work. Three groups of people are interested in each program. Employers have certain ideas, workers have others and often these are at variance with those of the school man, who is, after all, the most important, for he is the one who must make vocational education a reasonable insurance against social wreckage. Parents come with children who are seeking their work in life. Later it is expected to have lectures in the schools, and motion pictures illustrating the processes in different trades, and visits to shops to see the conditions which surround the work. The plans of the society involve printing reports on different industries for distribution among the teachers. The society will also work for a suitable law, and co-operate with the Commissioner of Vocational Education employed by the State Board of Education.

TEACHERS COLLEGE TO DISCONTINUE SHOPWORK.

The rapid development of graduate work at Teachers College, Columbia University, is bringing about important changes, and among them is the dropping of courses in shopwork. These will not be continued after this school year. The college evidently prefers to have this kind of work done in other institutions. In reply to a recent inquiry we have received the following statement from Dean Russell just in time for it to appear in this issue:

It is true that Teachers College has taken an important step in respect to manual training. When the department was established, teachers of manual training were expected to be more or less expert in shop practice. With the development in the field, and particularly with the increased attention to vocational education, it has come about that teachers of shopwork are expected to be skilled mechanics as well as teachers. We do not have the equipment, nor is it in accord with our plans, to specialize in the training of classroom teachers in this field. Consequently we have decided to abandon all shopwork of a highly technical or vocational character. In future our rooms, equipment and endowment will be devoted to the strengthening of our work in industrial arts for the elementary and junior high schools, and for the elaboration of our offering to graduate students who are already qualified by training and experience to engage in studies looking forward to administrative and managerial positions in vocational education. What we have done is, in effect, to curtail our offering in the technical subjects and to increase the opportunities to students in the pedagogical and administrative phases of vocational education.

THE ILLINOIS MANUAL TRAINING SURVEY.

At the last meeting of the Illinois Manual Arts Association, provision was made for a survey of the manual training work of the state by a committee consisting of C. E. Howell, Decatur, chairman, L. A. Tuggle of Danville, and L. D. Perry of Joliet, with the president of the Association, A. G. Bauersfeld of Chicago, ex-officio. Large data sheets have been prepared and sent out by the committee, and it is expected that its report will be ready to present at the time of the Joliet meeting, which comes early in the new year. The four main subdivisions of the investigation are (1) the shop and its equipment, (2) the time element and teachers, (2) course of study, and (4) administration facts. If all the items provided for on the data sheet are supplied the committee will be enabled to give some interesting data concerning the size, location and heating of public school shops, and a great variety of details concerning benches, lockers, machines and other items of equipment; the time devoted to manual training in the schools of the state, and the teachers salaries, preparation and experience. Many facts concerning the course of study, such as time given to demonstrations and to theory, methods of teaching, use of textbooks, etc.; and finally, facts concerning supervision, supplies, bills, relation to industrial organizations, and the attitude of school officials toward the work in manual training. This data sheet is calculated to call forth some unique information that will be of great interest to members of the Association and probably to manual training teachers generally.

THE NEW LAW IN PENNSYLVANIA MEETS WITH HEARTY SUPPORT.

In this issue we present to our readers an article on the "Pennsylvania Continuation Schools" by Wallace E. Hackett of the State Bureau of Vocational Education in Pennsylvania. This article states briefly the requirements of the new law.

Late in the month of November, Governor Brumbaugh issued a statement regarding the establishment of continuation schools thruout the state which indicated that at least three-quarters of the children now working in the state of Pennsylvania would be provided with continuation school facilities by January 1st when the Child Labor Act would go into effect. This fact reflects credit on the energy of the State Department of Public Instruction and on the city school authorities, teachers and employers of labor who have cooperated with the State Department in bringing this about.

Another encouraging feature of the Pennsylvania situation is stated by Governor Brumbaugh as follows:

> I am especially pleased with the attitude which employers of children generally have assumed. I am informed that wherever the school men have gone to places of business personally and talked with employers, explaining to them the benefits which would accrue both to them and to their young employes under this Child Labor Law, that they have expressed a willingness to meet all its provisions. In fact, some firms which had expressed themselves as opposed to the new law, have agreed to furnish space in their establishments for conducting continuation classes, and a few have even agreed to pay the teachers.
>
> I am particularly pleased with the manner in which the situation has been handled in Philadelphia. Four distinct steps have been taken by the Board of Education in that city.
>
> In the first place, an associate superintendent of schools was elected, whose duty it is to arrange for the establishment of continuation schools.
>
> Next, the Bureau of Compulsory Education was re-organized. Ten branch offices have been established throughout the city for the issuance of employment certificates, the physical examination of children, and as headquarters for the Compulsory Attendance Officers. In addition to this, these branch offices will also do work along the line of vocational guidance by endeavoring to find places for children desiring to work, and of finding employes for firms desiring to hire children under sixteen.
>
> Third, the Board has under consideration the salary schedule for teachers in the continuation classes. It is the intention to pay teachers in these classes from one to two hundred dollars more a year than will be paid to the regular grade teachers.
>
> Fourth, the Board has adopted a general policy of endeavoring to open as rapidly as possible, after January 1st, continuation classes for all those receiving employment certificates and entering upon employment at that time, and all the

additional classes needed in the regions where the number of children now employed is greatest. In addition, as rapidly as possible the schools already established in business and industrial plants will be taken over by the Board.

The Philadelphia Board expects to employ at least one hundred teachers in 1916, and I am sure that January will see at least seventy-five per cent of the working children under sixteen in that city, attending continuation classes.

In Pittsburgh a complete canvass of the city has been made to ascertain the number of children in employment. Provision has been made for the establishment of schools or classes in various sections of that city. I would not be surprised to see every working child in Pittsburgh attending continuation classes with the beginning of the new year.

In Bethlehem the high school will be used to house the continuation classes. The regular classes adjourn early and the continuation classes will have full use of the school building from three to five every afternoon.

The school authorities of Reading are at present interviewing manufacturers on the subject of organizing continuation school. Dr. Foos, superintendent of schools, reports that in all these interviews he has been cordially received and that the outlook for the success of the schools seems very encouraging.

Complete arrangements for the establishment of continuation classes are also being made in Scranton, Wilkes-Barre, Allentown, Johnstown, Altoona, Lebanon, Easton, Beaver Falls, Mauch Chunk, Harrisburg, Williamsport, York and many smaller communities.

The agents of the Departments of Public Instruction and Labor and Industry will visit before January 1st, every community in which it is necessary to establish continuation classes, and I am sure the new year will see ready and full compliance with all the provisions of the new law.

ART IN RELATION TO WOMEN'S WORK.

The illustration on the next page shows one of the cases in an exhibition of school work held in the Fine Arts Building, New York City in October. The exhibition was designed to show in how many ways and in how practical a fashion the art teaching of the high schools is carried over into constructive processes. It included work from the eighteen high schools in New York which have girls as pupils. It filled two large galleries with hundreds of pieces of craft work, and other hundreds of designs.

A feature of the exhibit was the group of girls from the Washington Irving High School who paraded thru the galleries from time to time wearing the beautiful gowns they had designed and made. To add to the gaiety of the procession they carried bright colored parasols of silk which had been trimmed in applique or stencilled with attractive motifs in color.

Another feature of the exhibition was the work in "draping" on

the living model. The girls took turns in standing as models for one another while their companions with a few deft turns of material and a few skillfully placed pins created dresses, apparently out of nothing, before the delighted eyes of the spectators.

Still another feature was a case containing a charming group of dolls in period costumes. This came from the Wadleigh High School where Miss Julia C. Cremins is in charge of the work. These dolls were so attractive that some of the professional dressmakers who saw the exhibit invited the students to exhibit at their own bazaar.

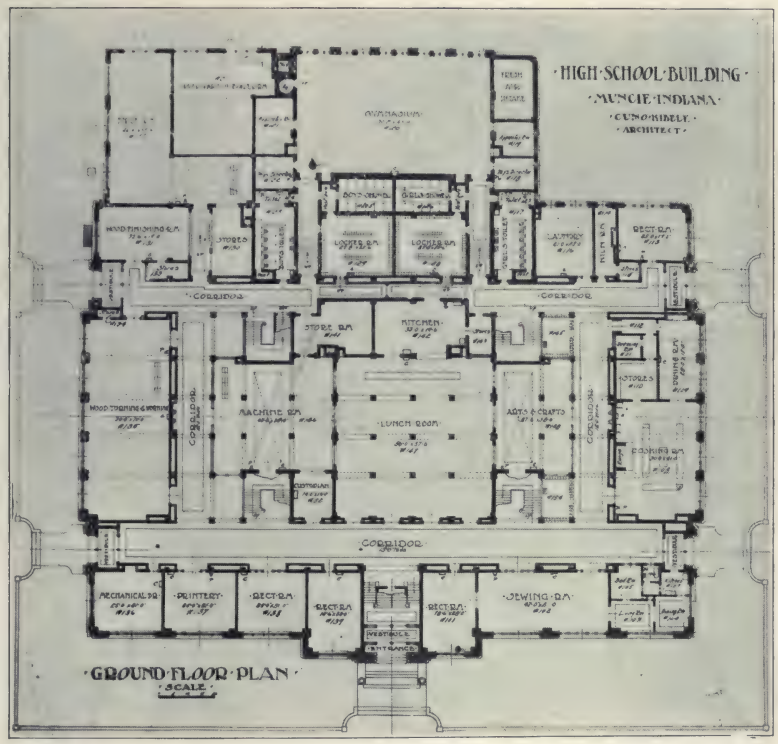
All this works comes under general supervision of Dr. James P. Haney.



CRAFT WORK EXHIBIT FROM THE BAY RIDGE HIGH SCHOOL, NEW YORK CITY.



NEW HIGH SCHOOL, MUNCIE, INDIANA, ERECTED AT A COST OF $275,000.



SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

ANNOUNCEMENT.

The editors announce a third competition in response to requests for projects suitable for teachers in rural communities and agricultural high schools. These projects may involve the use of a variety of material such as wood, metal, concrete, etc. The closing date is March 30th and the following prizes will be paid:

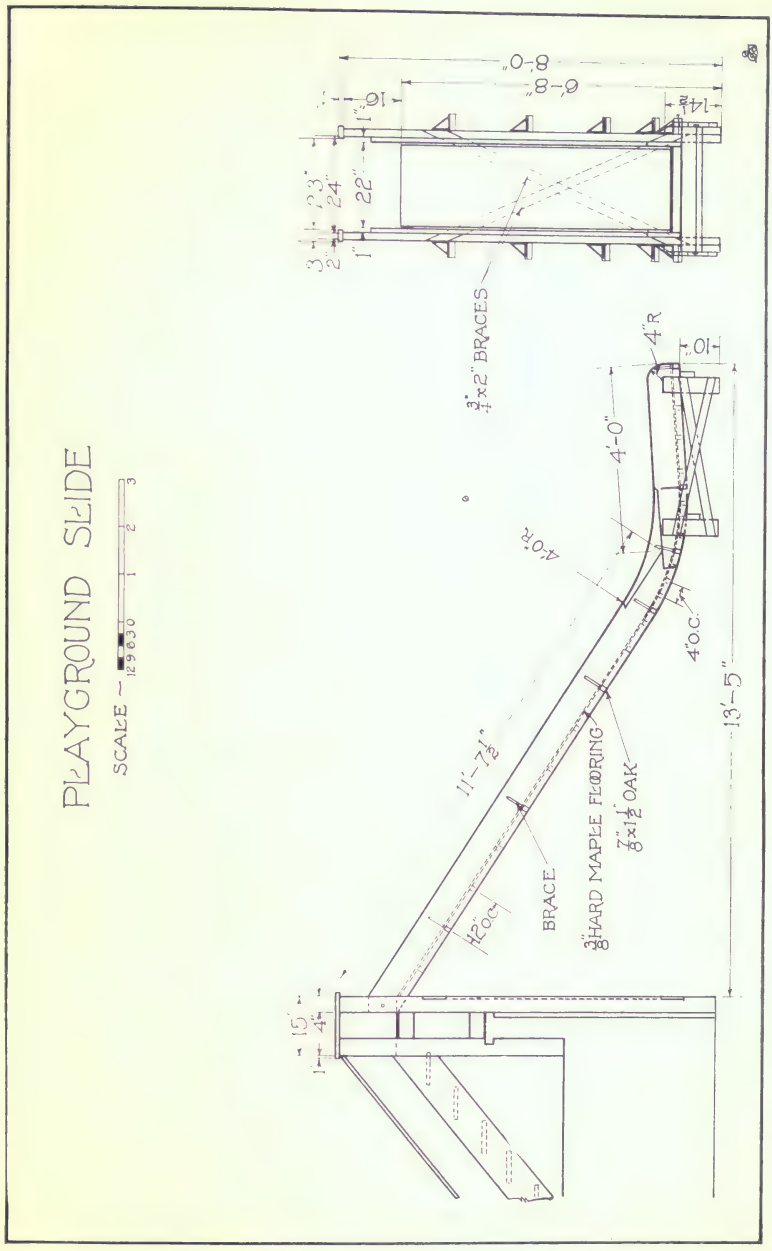
First, $10; *second,* $5; *third,* $2.50.

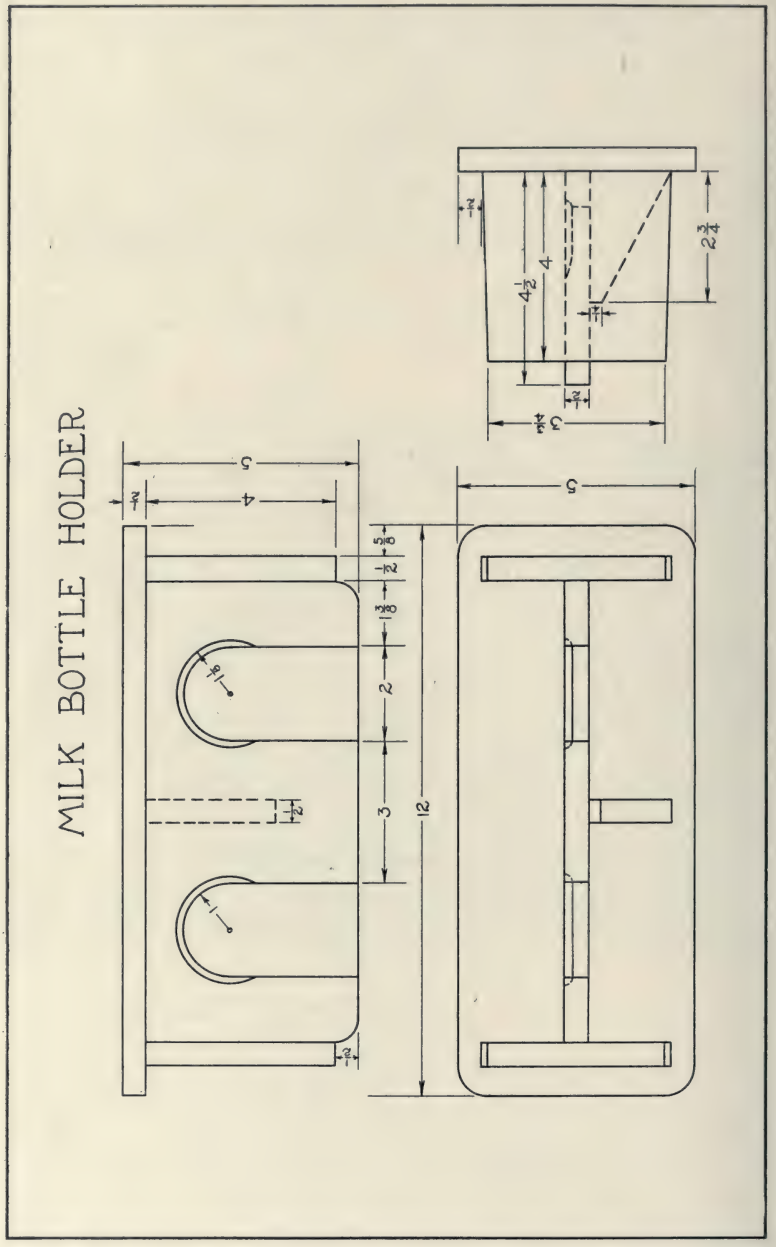
The metalwork competition announced last month closes Feb. 1st. Photographs, descriptions of processes involved, and drawings or blue prints of the projects are desired.



PLAYGROUND SLIDE.

The Senior class taking the Manual Arts course for Teachers at Bradley Institute were recently divided into groups, each group to investigate some line of woodwork and to report on its good or or weak points. One section made a study of playground apparatus, selecting the slide shown in the above photograph and the drawing as typical of this line of work. The project as a whole was discussed by the group as to design, construction, materials, etc., after which foremen were selected to care for the actual construction by smaller groups


PLAYGROUND SLIDE
SCALE
8'-0"
6'-8"
16"
1"
3"
2"
23"
24"
22"
14½"
3"x2" BRACES
4'R
10"
4'-0"
2'-0"
4'o.c.
11'-7½"
13'-5"
BRACE
12o.c.
⅜" HARD MAPLE FLOORING
⅞"x1½" OAK
15"
4½"


MILK BOTTLE HOLDER
5
4
5
4½
4
2¾
12
3
2
1⅜
½
⅝
1

of the stairway, platform and the slide proper. This project, made to fit given conditions, was set upon a porch leading down into the yard. The stairway and platform would need to be varied to suit other conditions. The sides of the slide proper are made of 1″x7″ hard pine, each side being made of three pieces cut and joined as indicated. The floor is made of ⅜″ hard maple, selected stock running the full length of the slide. This floor is nailed to ⅞″x1½″ oak crosspieces, located as shown, each joint being painted with white lead before the next strip is nailed in place. ⅜″ quarter round is placed in the corners where sides and floor met. To keep the sides square with the floor several of the oak crosspieces project thru the side sufficiently to have a small shelf bracket screwed in place, while the other crosspieces are housed into the sides and fastened with screws.

The sides of the slide project beyond the upper end of the floor in order to be bolted to the platform by two ⅜″ carriage bolts. The lower end of the slide rests freely on the supports shown. White pine 2″x4″ stock is used for the heavy timber, the joints being mortise-and-tenon held together by ⅜″x5″ machine bolts. All of the slide was painted with a prime coat of white lead and oil followed by two coats of outside grey to match the stucco of the house, except the floor which was scraped and sanded and then treated with several applications of hot linseed oil and a thin coat of wax. A canvas cover is used for protection against rain or snow. The cost of material was as follows: lumber $4.30; hardware $.50; paint and oil $.95; canvas cover $1.00. The drawing was contributed by Edgar S. Shelton.

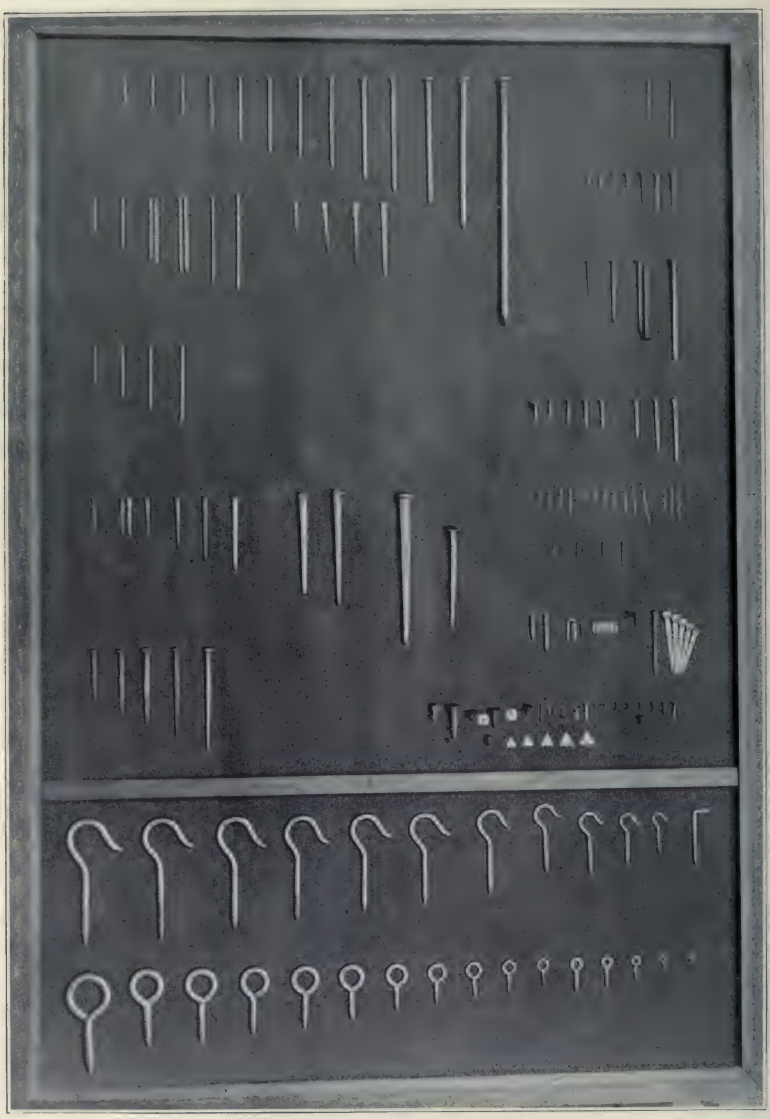
MILK BOTTLE HOLDER.

This problem was suggested for use in the practice teaching classes by a former student, A. L. Jordan, of Cleveland, Ohio. If the shop is not provided with an expansive bit the openings may be cut with a coping or keyhole saw, the large curves for the rim of the milk bottles being omitted or cut with a gouge. The complete project is finished with two coats of paint, after which it may be screwed, or hung by screw eyes, in some convenient place.

ILLUSTRATIVE MATERIAL IN TEACHING.

Students in manual arts classes often fail to realize the rich fund of informational material pertaining to the problem in hand because the instructor has little or no illustrative material to enrich his teaching. The following pages are devoted with considerable satisfaction to illustrations suggestive of greater possibilities in teaching. These exhibits were selected from a series prepared by Harry L. Hurff, instructor in machine woodworking, Bradley Institute, for use in his classes. Each chart is made of Compo board, covered with brown denim or white muslin. The frames, measuring 2′6″x3′6″, are made of hard pine stained and finished to match the trim of the room in which they are hung.

The making and use of such material has not only stimulated the interest of students, but has also been an incentive to the instructor to analyze more carefully various lines of related material and to prepare exhibits of them in a similar manner.



NAILS, ETC.

This exhibit shows practically every kind of nail, brad, etc., obtainable at the ordinary hardware store. The upper row, for example, shows nails ranging in size from 2 to 100 penny. Students are required to know the name and use of all items and to identify them at sight.



HARDWARE BOARD.

This exhibit is partially filled with samples of the light hardware in common use, either in the school shop or in the students home. Its purpose is to inform the student of the proper kinds of hardware to use in a given case, as well as to enable him to know each article by its name so that he may purchase intelligently.



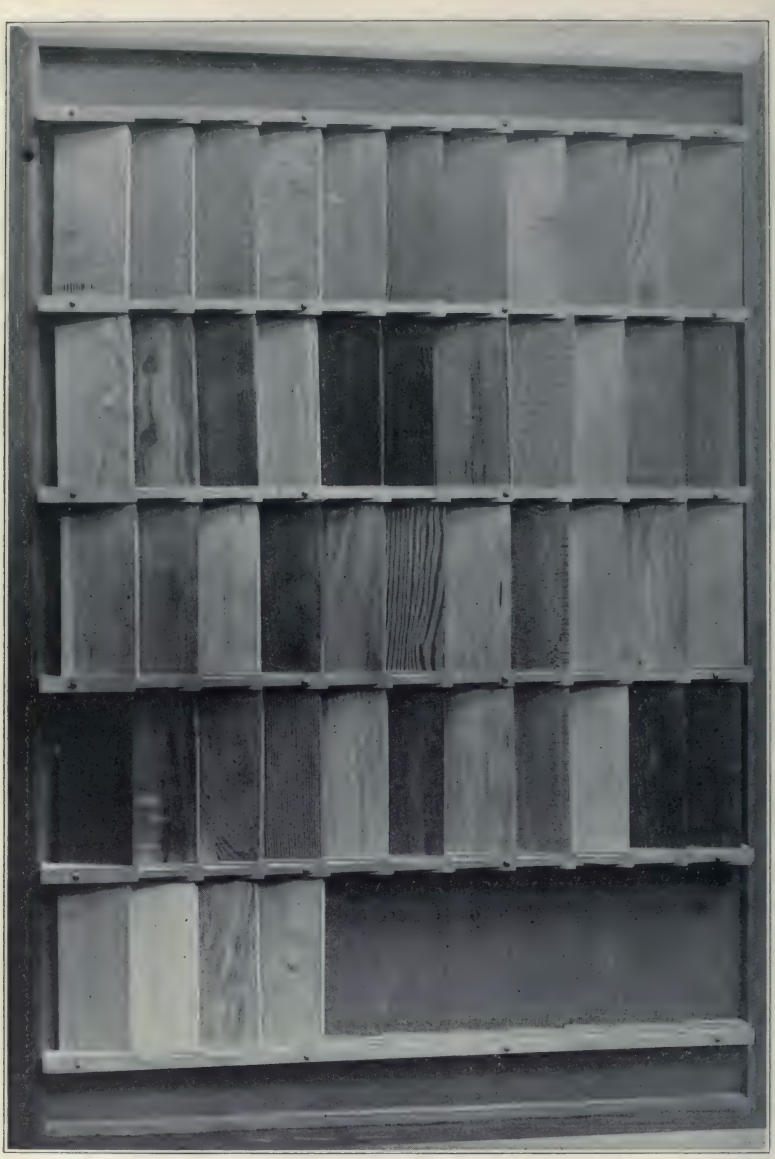
FORESTRY.

A study of trees should accompany work in wood, but this is often neglected because it is not possible to see trees growing which are of the variety in use in the class. A glimpse of the real bark is of great assistance in teaching a student identify trees. This collection of local trees is used to study texture, color, etc., of the bark and wood. In order to test the students' knowledge, none of these samples are labeled.



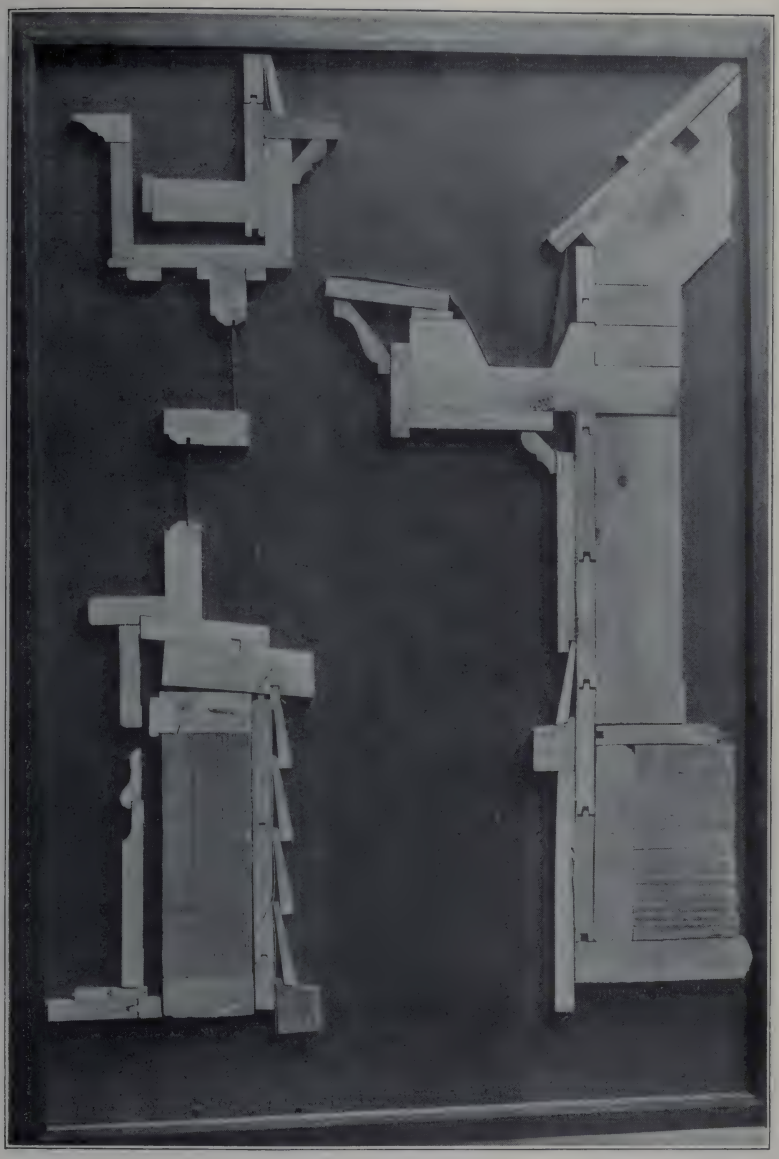
LEAVES.

This photograph shows two exhibits of leaves of local trees. These were gathered and pressed during the summer, then placed on the boards and covered by glass to protect them from injury. The exhibit boards shown above are the same in size as the preceding ones.



WOOD SAMPLES.

The accompanying exhibit frame is designed to hold samples of most of the kinds of wood used in schools and factories. Six strips of wood, cut by diagonal grooves as shown in the photograph, are screwed to the exhibit board. The wood samples, cut to uniform dimensions, are readily put in place or removed with the thumb and fingers.



HOUSE CARPENTRY.

Students of architectural drawing without previous experience in carpentry, as well as beginning students of carpentry, sometimes find it very difficult to visualize types of construction. This exhibit represents a vertical section thru a wall containing a window frame, and a vertical section of an ordinary box cornice and box sill. With the exception of height all measurements are full size. The pieces of wood are cut ½″ thick and mounted in the order shown.

REVIEWS

Readings in Vocational Guidance. By Meyer Bloomfield. Ginn & Co., Boston. 5x8½ in.; 723 pages; price, $2.25.

It is quite impossible to give within the space allotted an adequate review of this timely book. For several years many educators have been studying the problem of vocational guidance, and this book is a carefully organized compilation of the most significant magazine articles, addresses, and other contributions to the literature of the subject. The subject has been considered from almost every angle, and parents, educators, and students of modern educational problems may acquire from the book first-hand knowledge of the utmost consequence to them. The contents is grouped under the following heads:

Part I. The Viewpoint of Vocational Guidance. The first article is by Dr. Charles W. Eliot on "The Value during Education of the Life-Career Motive." This is followed by articles discussing the social waste induced by lack of vocational guidance, the wasteful recruiting of trades and occupations, the relation of the schools of vocational guidance, and the necessity of professional training for vocational counseling.

Part II. The Foundations of Vocational Guidance. This covers articles and discussions of definite factors entering into vocational guidance, including viewpoints of its application to boys and girls in elementary schools, constant and variable occupations and their bearing on the problem, vocational aims of high school pupils, effect of noise, fatigue, and environment on the worker, and the permanence of interests, and their relation to abilities.

Part III. Examples of Vocational Information. The basis for information concerning the work of the architect, the grocer, and the machinist is supplied by three booklets distributed by the Vocation Bureau of Boston. The occupations and industries open to children between fourteen and sixteen years of age, a survey of occupations open especially to girls of this age, and the result of inquiries into three lines of juvenile employment in London, are covered in this part.

Part IV. Some Practical Aspects of Vocational Guidance. Under this head the author discusses medical inspection at the start in life, school and employment, and vocational guidance in Birmingham, England.

Vocational guidance is to make "school life more interesting and productive," and for this reason the subject is worthy of the fullest investigation.

Business Psychology. By Hugo Münsterberg. La Salle Extension University, Chicago, Illinois; 5¾x8¼ in.; 296 pages.

The first half of the volume by this well-wnown scientific investigator in the field of psychology, is devoted to a careful treatment of perception, memory, sensation, feeling and emotion, impulses and will, and suggestion. At first thought the relation of these mental processes to the everyday business life may not be apparent, but this seemingly impractical study is necessary if the practical discussions of the latter half of the book are understood. Salesmanship and advertising, learning and training for technical labor, choosing the right position

and selecting the right employe, greatest efficiency at work and avoidance of fatigue, treatment of customers and of partners, securing the most favorable conditions for work and adapting the work to one's liking, and ever so many other problems confront the business world and can be answered intelligently only by psychology.

The last half of the book brings together those results of modern psychological thinking which are significant for the work of the business man. It covers the acquirement of abilities, the inner and outer conditions of efficiency, vocational misfits, individual mental traits, selection to fit individuals, and mental tests. In addition to a very complete index, many references are given for further reading. The book will repay the serious study necessary.

The Practical Book of Period Furniture. By Harold Donaldson Eberlein and Abbot McClure. J. B. Lippincott Company, Philadelphia. 6½x8¾ in.; 371 pages; price, $5.00.

The revival of interest in period furniture makes this a timely book. In writing the volume the authors had it in mind to produce a "book of brief compass and succinct arrangement for ready reference to tell the reader what he wished to know and all that he needed to know in order to identify and classify any piece of period furniture, whether original or a reproduction." The furniture of the English, American, Colonial and Post-Colonial, and the principal French periods are treated. The Jacobean period is the first covered, dating from 1063 to 1688. The other periods follow in order, ending with the American furniture of the latter part of the eighteenth century. The Illustrated Chronological Key at the beginning of the book is of inestimable value in showing at a glance the dominant characteristics of each period style.

The book is profusely illustrated and beautifully printed, and invites reading to the very end. The Introductory chapter alone reveals the fact that the authors are qualified to produce a worthwhile book on the subject. An additional charm is lent this very interesting book by the choice language in which it is written.

Principles and Practice of Elementary Drawing. By Mabel Browning Soper. Scott, Foresman and Company, Chicago and New York, 1915. 7½x10 in.; 148 pages; price, $1.50.

This is a normal school textbook, embodying the fundamental principles of the teaching of art in the elementary public schools. The subjects treated are: I. Design—including picture study and lettering. II. Represenation—(a) Nature (Plant) Drawing; (b) Animal and "Pose" Drawing; (c) Object Drawing, including composition and perspective. III. Mechanical Drawing, including diagrams, and "working directions." IV. Color Theory, developing sense perception to select, reproduce, and combine colors harmoniously.

This material has been successfully used as a basis for class demonstration, instruction by the teachers, and for home study by the pupils. The illustrations include work of normal students and professional artists, as well as reproductions of the great masterpieces. A careful study of the text cannot fail to develop one's power of observation and aesthetic appreciation.

Wage Worth of School Training. By Anna C. Hedges. Teachers College, Columbia University, New York, N. Y. 6x8¾ in.; 174 pages; price, $2.00.

To gather the material for this book involved seeing twenty thousand girls at work in the textile field, conferring in detail with foremen, forewomen, and managers, questioning several hundred girls themselves, and making an exhaustive study of 617 questionnaires. The details of the resultant conclusions are of special interest to those who are directly responsible for the education afforded girls in our schools today. Vocational guidance workers and social workers also will be interested in the results of this inquiry.

The investigation has convinced the author that instead of trade training for girls whose schooling must be limited to the grammar school, there should be provided more and better general education for all grammar school girls, irrespective of their career beyond the elementary school. To quote: "The applicant for work must have a foundation in good health, in comprehension of English, in dexterity, and in sound work ideals, all of which will mean adaptability, industrious habits, and the desire and ability to cooperate. On this basis productive, progressive, and wage-earning work depends, whether it be in the factory, office, college, on the farm or in the home. Training of boys and girls alike in these essentials devolves on the elementary school."

RECEIVED.

Proceedings of the Eighth Annual Meeting of the National Society for the Promotion of Industrial Education. Report of the Richmond meeting. Bulletin No. 20. Issued by the Society, 140 West 42nd St. New York City.

Course of Study in Manual Training. Prepared by Committee appointed by the Wisconsin School Arts and Home Economics Association. Published by C. P. Cary, state superintendent of public instruction, Madison, Wis.

Circular of Information Relating to Continuation Schools. Boston Public Schools. This illustrated pamphlet gives much valuable data on the results of continuation school work.

Bulletin of the Board of Education, Massachusetts. This is No. 6, 1915, and deals with continuation schools, training classes for teachers in vocational schools, state aided vocational agricultural education, and statistics regarding state aided vocational schools.

Problems of Vocational Education in Germany. With special applications to conditions in the United States, by George E. Myers. Bulletin No. 33, 1915, issued by the U. S. Bureau of Education.

MANUAL TRAINING AND VOCATIONAL EDUCATION

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FOREWORD

IT is already known to the readers of this magazine that the editors are endeavoring to present a series of articles, each written by a different person, giving the results of experiments that have been made and are being made in efforts to determine how and to what extent factory and productive shop methods should be employed in school shops. The first of these was the one entitled "Jigs" by *Fred P. Reagle* in the May number: The second was entitled "Beginners in Trade Schools" by *Egbert E. MacNary* in the September number; the third is the article in this issue by *Arthur W. Richards* of the Ethical Culture School, New York City; others will follow. Readers will do well to make a comparative study of the points brught out in these three articles.

The article on vocational guidance by William G. Bate principal of the high school at Mankato, Minnesota, ought to be helpful to a large number of readers because it deals with conditions that are typical of many high schools.

The article on the "Correlation of Design and Sewing" is the first of a series by a very successful teacher of art applied to needlework, *Miss Lua R. Crawford* of the William L. Dickinson High School, Jersey City, N. J. Her aim in the series will be to have each article full of practical suggestions which may be made use of by other teachers.

One of the newer lines of grammar grade shopwork for boys is attractively presented by *L. J. Mitten* of Wilmette, Illinois, in his article on "Playground Apparatus."

J. Calvin Nicholson concludes his valuable series of practical problems for elementary machine drawing in this issue.

Dr. Geo. E. Myers contributes a timely bibliography of Surveys which will be especially appreciated by students of current educational problems.

Probably the most important event recorded in this issue is the opening of continuation schools thruout the State of Pennsylvania. The article by *Wallace E. Hackett* of the State Bureau of Vocational Education gives the plan of these schools, and the statement by Governor Brumbaugh in the "Of Current Interest" department gives an idea of the extent of the application of the new law.

This Magazine is kept for sale at McClurg's in Chicago, and Brentano's in New York.

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FIELD NOTES

EFFORTS to deter children from prematurely leaving school to enter unskilled industries are being made by the subcommittee on vocational guidance of the Chicago Association of Commerce. Arrangements have been made in 20 schools whereby all applicants for school certificates shall see the committee's representative. Insistence is placed upon the presence of one of the parents for consultation regarding the child's leaving school. This plan is already justifying itself for not a few of the boys and girls thru this contact with the parents, have been influenced to remain in school. It is found that the ability to reach such children before they possess a working certificate is of great assistance in persuading them not to quit school for work.

ILLINOIS MANUAL ARTS ASSOCIATION.

Albert G. Bauersfeld, president of the Illinois Manual Arts Association, gives the following statement of plans for the winter meeting:

The thirteenth annual convention of the Illinois Manual Arts Association will be held in Joliet on February 18 and 19, 1916. The program will center around a survey which is being made by manual training teachers of Illinois. The aim of this is to find out the present conditions of the manual arts teaching in the state.

Altho the details of the program are not completed, the plans of the executive committee give promise of a very interesting meeting. The following speakers have been invited to take part: John D. Shoop, superintendent of Chicago schools; C. A. Prosser, Dunwoody Institute, Minneapolis; W. H. Varnum, University of Wisconsin; Albert F. Siepert, Bradley Institute, Peoria; C. E. Howell, Decatur; Miss Hinchliff, DeKalb Normal School, and C. W. Sylvester, Springfield.

On Friday morning demonstration lessons in manual training and domestic science will be given by teachers in the Joliet schools. The manual arts subjects as conducted here under the supervision of L. Day Perry are especially worthy of study.

This year the Association wishes to extend its sphere of usefulness by inviting all of the domestic science teachers of Illinois to attend its convention. Not only will a place be given on the general program for the ladies, but a round table meeting is being planned for their department. A joint organization of all teachers of vocational subjects in Illinois, it is believed, would be very desirable.

A special effort is being made this year to have the attending teachers come in chartered coaches. Already one is promised from Southern Illinois, and two from Chicago. Past experience has shown that a delegation of visiting teachers derive a great deal of enjoyment and benefit from traveling in the same coach for part of a day.

TEACHING SALESMANSHIP IN MINNEAPOLIS.

Courses in salesmanship are being offered in the Girls' Vocational High School, Minneapolis, which are planned to meet varying needs. The business course covers two years; it is required in the first year, and optional the second year. The basic principles of salesmanship are given, with special emphasis upon the personal requirements necessary for a good saleswoman. In the second year the work is elected by the girls who are intending to go into the business, and the course includes thoro work in textiles, a comprehensive study of one or two lines of merchandise, store organization and the relation of the saleswoman to her store and patron.

A second course is being arranged for girls who are now employed as saleswomen in various stores in the city. This course occupies three hours every morning, four mornings a week, and extends over a period of three months. The work includes textiles, design, hygiene, arithmetic, English and salesmanship.

A third course is in contemplation for high school graduates who wish to take up the work of saleswomen with the purpose of becoming forewomen, buyers, and assistant buyers.

A VOCATION BUREAU IN KANSAS CITY, KANSAS.

"That the years of adolescence may be used more advantageously and that the evils preval-

(Continued on p. VI.)

ent in every city may be counteracted," the board of education of Kansas City, Kansas, has established a Vocation Bureau. According to an attractive pamphlet issued by I. B. Morgan, principal of the continuation schools, the Bureau directs its efforts as follows:

1. To furnish to young men and women information concerning the industries of Greater Kansas City.
2. To lead young persons to study themselves and the different vocations.
3. To assist them in selecting the vocations for which they are best fitted by nature.
4. To direct their studies so that they can better prepare themselves for their chosen vocation.
5. To keep them in school, if possible, until they are fully equipped for life's work.
6. To avoid great waste of human effort, owing to misfits and inefficiency.
7. To secure the cooperation of the home, the church, the school, and all other uplifting organizations and instrumentalities, to solve with the young man or the young woman the occupation problem.
8. To bring to the young men and young women the ideas of business men concerning the characteristics and qualifications essential to success.
9. To assist worthy and efficient young men and young women to secure the positions for which they are best qualified.

The school board of Erie, Pa., has just approved $1,000,000 bond issue for the purpose of re-organizing the school department on the six-six plan. A $450,000 junior high school is being erected. This building will have a separate gymnasium for boys and girls under a terrace which fronts a stadium. This is the first stadium to be built for a high school east of the Rocky Mountains. The building also will provide adequate shops and domestic arts rooms for all vocational and domestic arts subjects. In the east wing of the building there will be a community club and reading room which will be open to all citizens of Erie. The central high school is to be remodeled into a cosmopolitan high school. The plan when completed will give each section of the city a junior high school. Wm. Ittner, of St. Louis, is the architect in charge of the building operations, and A. B. Fairbanks has been elected director of all the manual arts and vocational work of the city. Superintendent Bush is receiving congratulations from school men all over the state of Pennsylvania on his progressive plans.

The annual conference of the Association of the Secondary Schools of the Upper Ohio Valley, was held at the University of Pittsburgh on Friday and Saturday, November 26th and 27th. The main theme of the whole conference was vocational guidance. At the opening session Jesse B. Davis, president of the National Vocational Guidance Association, gave a lecture on vocational guidance which was followed by a general discussion.

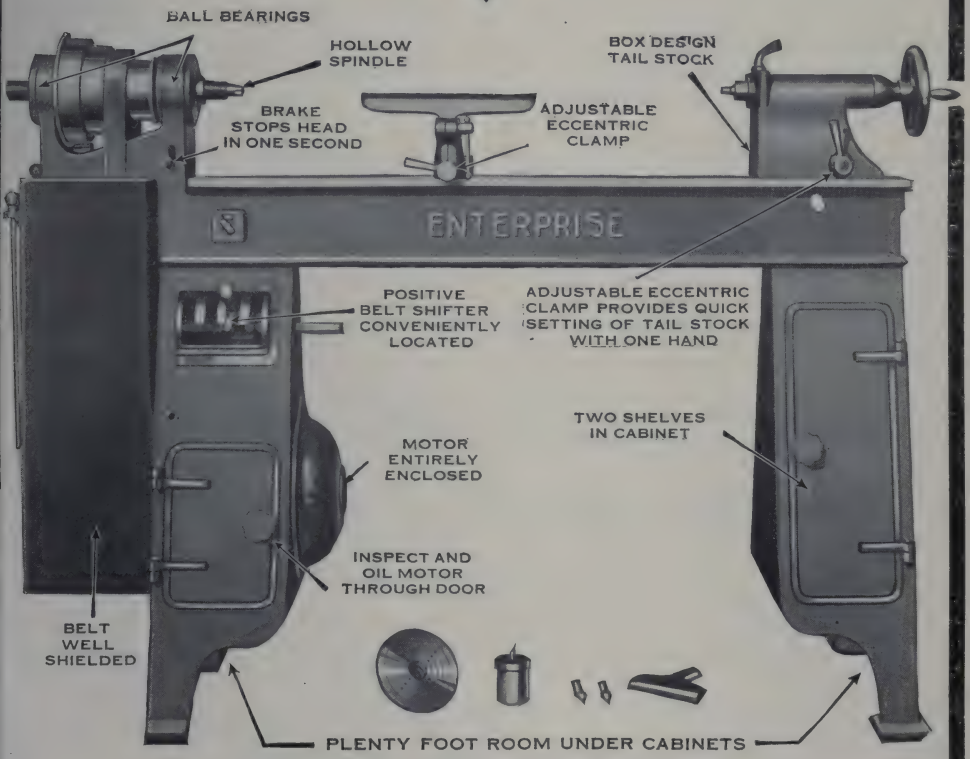
The Administrative Section program consisted entirely of addresses on vocational guidance. The subjects were as follows: "Pre-vocational Schools—A Comparison of Cities," by F. B. Steltz, superintendent of schools, Braddock, Pennsylvania; "Vocational Education" by H. H. Baish, superintendent of schools, Altoona; "How to Organize a Bureau of Vocational Guidance," by Jesse B. Davis; "Continuation Schools in Pennsylvania," by Millard B. King, director of the State Department of Industrial Education. Since this subject is the most live one in Pennsylvania educational circles today, it brought forth a spirited discussion.

The following was the program of the Industrial Arts Section: "Pennsylvania's Progress in Vocational Education," by E. L. Bowman, supervisor of industrial education, State Department of Public Instruction; "The Effect of Educational Training on Industry and Commerce," by C. R. Dooley, secretary of the educational department of the Westinghouse Company, Pittsburgh; "How we may Profitably Increase the Work done in the Public Schools by Industrial Education," by George M. Gerhing, of the Pittsburgh Board of Public Instruction; and "The Training for Teachers for Vocational Guidance," by Walter Van Dyke Bingham, of the Carnegie Technical Institute.

(*Continued on p. VIII.*)

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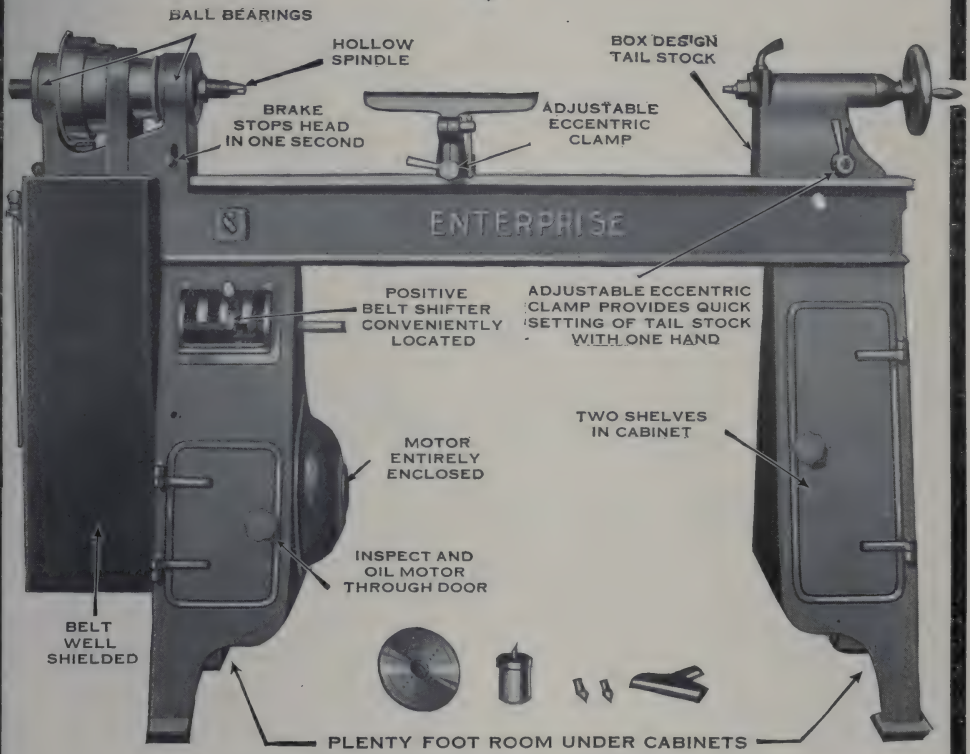
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(*Continued on p. VIII.*)

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FIELD NOTES—(*Continued from p. VI.*)

At the present time there are about 900 public schools and institutions in the United States in which printing is being taught, and the number is rapidly increasing. In order to standardize the instruction given in these various schools, steps are being taken to form an organization to be known as the National Association of Printing Teachers. For the greater convenience of the members, it has been suggested that the Association be divided into three sections, namely, the Eastern, Central and Western, and that the district meetings parallel the conventions of the Eastern Arts Association and the Western Drawing and Manual Training Association. The following teachers have agreed to act as organizers in their respective districts: Eastern, Joseph A. Donnelly, Public School No. 158, Brooklyn, and Frank Siddall, Boys' Industrial School, Newark, New Jersey; Central, Miss Katherine Stilwell, University of Chicago Elementary School, Chicago, and W. Ernest Reeves, Franklin School, St. Louis; Western, Orley W. Athey, High School, Portland, Oregon. Teachers desiring to join the Association or seeking more information regarding it, are urged to correspond with any of the organizers representing the district in which they may be located. Mr. Reeves is the originator of the movement and will act as chairman of the organization until the respective sections choose their officers.

A large rural vocational high school was opened at Leesport, Pennsylvania, in September last. This school is named the Ontelaunee Vocational School, and is well equipped for the school work of that community, specializing in agriculture and industrial work. The agricultural department, numbering 30 students, devoted a great part of its time this fall to studying the field conditions of the neighborhood. Field tests were taken to study the various kinds of soil in relation to the crops; a study was also made of the various kinds of trees and the place they should have on each farm. In addition to these trips, poultry yards were visited and a study made of the various kinds of poultry, as well as the housing conditions of the same.

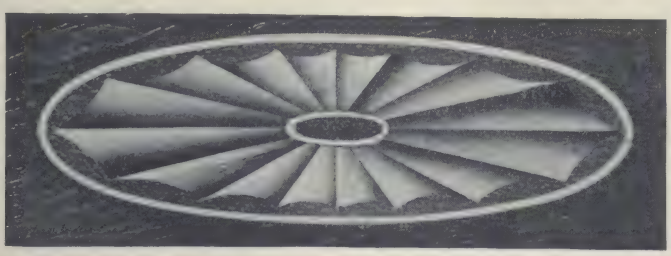
The laboratory equipment is quite large, part of which has been made by the boys in the shop. Shopwork consists chiefly of making articles to be used by the average farmer. Up to the present time each of the boys has made a bench-hook and a framing square, and other things made by the class in general are a clothes rack, a table, a book case. Each of the boys is making a mitre box to be used in the shopwork.

In a recent address before the Social Economics Club of Milwaukee, Jesse B. Davis, of Grand Rapids, Michigan, said: "We have no accurate statistics regarding the great number of misfits in life, but the percentage of those not in the right work is exceedingly large. Hence the great need of vocational guidance while youth are receiving their education.

"The seventh, eighth and ninth grades, or the first year high school, should be organized into an intermediate or junior high school, where the work should be departmental, preparatory for the high school courses, where the work is along vocational lines. In this junior high school, along with the customary studies we in Grand Rapids add a course which rotates a pupil thru the different lines of work to test out his ability, the teacher studying him carefully. The moment the pupil does not come up to the average mental test in one line he is switched to another. This pre-vocational testing out prepares him to make the best decision as to what step next to take."

It is supposed that students who by choice enter a technical school have well-defined plans for their future work. However, this does not always follow. In Worcester Polytechnic Institute the problem of vocational guidance is met continuously by the individual instructor as the need arises. There are always many in the entering class who soon find out that they are in the wrong school. When it becomes evident that they are "misfits" so far as this particular institution is concerned, some other institution is recommended, which in the opinion of the instructor is better adapted to the abilities and tendencies displayed in their work. Vocational guidance during their high school years would save this loss of time and energy at a period when the cost is an added factor in their choice.

(*Continued on p. X.*)



PRACTICAL INLAY WORK

A booklet full of interesting and valuable information pertaining to this ancient art, written so as to be understood readily by anyone.

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(Signed) DONALD V. FERGUSON
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Henry Disston & Sons, Inc. **Philadelphia, U. S. A.**

FIELD NOTES—(*Continued from p. VIII.*)

The following facts concerning conditions in North Dakota have just come to hand:

"In the 41 first class high schools of the state, with the exception of those in the three cities, there is an average of 50 boys in attendance; while in the 82 second and third class high schools the attendance of boys averages between 12 and 13. Practically all of the first class schools have manual training with an average of about $500 in equipment, and about 53 of the others have equipment for manual training of which eight are valued under $100. The larger number of men who are teaching shopwork have to teach other subjects, and most of them are either principals or superintendents of schools."

The State Department of Education of the University of New York has arranged for a series of vocational conferences to be held in different parts of the state. The object of these conferences is to develop a spirit of cooperation among the vocational teachers of the state and to bring to their attention the best educational thought pertaining to this phase of education. One conference has already been held. The places and dates for the remaining conferences are as follows. Troy, January 21 and 22; Utica, February 11 and 12; Elmira, February 17 and 18.

The first annual institute of trade, general industrial, continuation, part-time, and evening vocational school teachers of New York State will be held in Albany on May 4, 5 and 6, under the auspices of the University of the State of New York. Detailed announcements will be made later.

Mt. Carmel township, located in the coal regions of Pennsylvania, having a population of about ten thousand, started a household arts evening school in November. P. L. Donohue, county superintendent, planned for a registration of twenty, but on the first night, one hundred and one girls and women were admitted for class work, and during the evening over one hundred more applicants were received. The school district is opening additional classrooms, and has engaged five teachers to handle the work. Mrs. Mary Brodey is the supervisor in charge of the work.

At a meeting of the School Crafts Club, held at the Ethical Culture School, New York City, November 13, 1915, William T. Bawden, of the U. S. Bureau of Education, and one of the editors of this magazine, was elected to honorary membership in the Club. The honor is especially appreciated by the recipient, since his first connection with the club dates back to the year 1902-03, when he was a student at Teachers College, and the Club was in its infancy. During all of the years since that time the work of the Club has been followed by him with the greatest interest.

Professor Fred C. Whitcomb, head of department of industrial education, Miami University, Oxford, Ohio, has been given a temporary appointment in the Division of Industrial Education, United States Bureau of Education. The Bureau is making a survey of the State of Delaware, and Mr. Whitcomb has been assigned to take charge of the field work of the industrial section.

"Vocational Education in the High School," will be the subject of debate in many of the high schools of the State of California on February 4, 1916. The general subject was announced December 6; thirty hours before the debate a more definite question will be received by the debaters. These debates are sure to interest parents as well as students, and a lively contest may be expected.

Teachers of drawing in the high schools of Boston, and assistants in the department of manual arts, are having an opportunity of studying commercial processes of reproduction, such as wood and lineoleum engraving, and copper and zinc etching. The classes are held in the Eliot School, Jamaica Plain, on Wednesday afternoons frm 3 to 6 o'clock, and on Saturday mornings from 9:30 to 12:30. Maximillian Rabus, instructor in bookbinding at the Winthrop Street Pre-vocational Center is the instructor.

At the morning meeting of the Manual Arts Section of the Annual High School Conference held at the University of Illinois, November 18 to 20, the following papers were read and dis-

(*Continued on p. XII.*)

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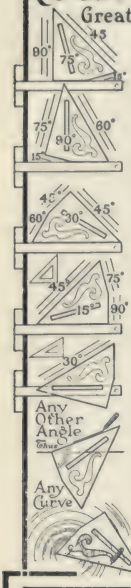
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MANY HIGH and Technical Schools throughout the land are profiting by its adoption. Are you?
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Valuable for its accurate data regarding textile fabrics, their manufacture and use. **$1.25.**

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For beginners and for shop-workers. No other book includes so many industries in so teachable a form. **$1.00.**

Halstead's Working Drawings for Cabinet-Making Models
A collection of working drawings of furniture for high school classes. **$2.00.**

Halstead's Manual Training in the Grades
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Reilly's Rational Athletics for Boys
Commended by the leaders in physical education. **90 cents.**

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FIELD NOTES

(*Continued from p. X.*)

cussed: "Presenting a Typical Problem," by L. Day Perry, supervisor of manual training, Joliet; "Design as applied to Wood Work," by Arthur F. Payne, assistant professor of manual arts, Bradley Polytechnic Institute, Peoria. In the afternoon W. F. Book, state director of vocational education, Indianapolis, gave an address on "Vocational Education and the High School."

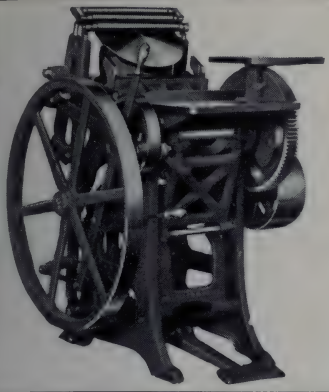
The annual meeting of the National Society for the Promotion of Industrial Education will be held in Minneapolis, January 20 to 22. Inasmuch as the majority of the members and delegates who will attend the meeting will either start from or pass through Chicago, the Chicago, Burlington & Quincy Railroad has made arrangements for a special train to be placed at the disposal of members and delegates. This special train will leave Chicago at 6:30 p. m. January 19, arriving in Minneapolis 7:55 a. m. on the morning of the 20th.

The large attendance at the Du Pont Night Trade School, Louisville, attests the need of such an opportunity. Among those who are taking advantage of this open door to increase their earning power are messenger boys, automobile mechanics, tailors, machine shop apprentices, clerks, "handy men," office boys, pharmacy clerks, grocery clerks, tinners, bundle boys, wrappers, plasterers, cable-splicers, carpenters, unskilled laborers, shoemakers, bookkeepers, butchers and stenographers.

In order to stimulate attendance in their night schools, the school department of Holyoke, Massachusetts, distributed a number of interesting posters bearing the caption "America First." They were printed in six languages and read as follows: "Learn English; attend night school ; become a citizen. It means a better opportunity and a better home in America. It means a better job. It means a better chance for your children. It means a better America. Ask the nearest public school about classes." Its appeal was directed for the most part to foreigners. Such posters have been prepared and sent out by the U. S. Bureau of Education.

The High School at Warren, Pennsylvania, now offers a two-year course in household arts,

(*Continued on p. XIV.*)



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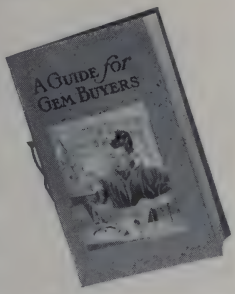
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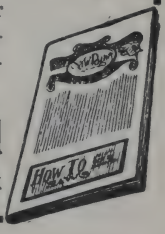
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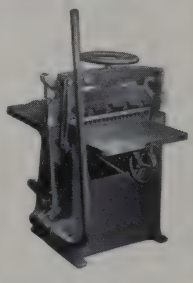


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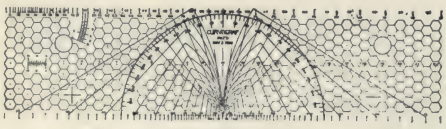
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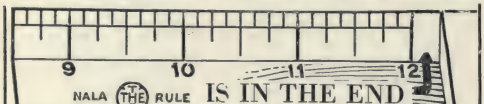


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FIELD NOTES.

(*Continued from p. XII.*)

which admits any girl who has completed the sixth grade. These girls otherwise would have left school without any preparation in the duties of home making. This household arts course maintains a lunch room in the school building, where the girls and teachers are served with lunches at a nominal price. Although the prices are graded as near as possible to the cost of the articles, the cost amounts to about $40 a month.

Kane, Pennsylvania, inaugurated a four-years course in household arts in the high school. Superintendent F. R. Neild, has worked out an ingenious and interesting scheme of operation. Miss Isabel Gildersleeve, who is in charge of the cooking classes, is instructor also of the nurses of the Kane Hospital in invalid cooking and dietetics. Dr. Burdick, a staff interne, lectures to the girls of the high school on preventative medicine, home sanitation, and home nursing.

Carlos M. Cole, superintendent of Denver public schools, has a vision for the extension of vocational opportunities wherever there is a desire for it. He says: "I hope to see the time when any newsboy, any mechanic, any shop girl or milliner can come to a vocational school in Denver, tell the instructor that he has an hour or two at stated times of certain days, and that he wishes instruction along certain lines, and be assured that he will be given the schooling he needs just when he can take it."

The United States Bureau of Education has begun an investigation concerning the graduates of typical high schools in different parts of the United States to find out for purposes of vocational guidance what occupations boys have followed since leaving school. The inquiry will be conducted by Charles L. Jacobs, of San Jose, Calif., under the general direction of Dr. W. T. Bawden, specialist in industrial education for the Bureau of Education.

The board of education at Cairo, Illinois, has added the following to the high school equipment: a variety saw, mortising machine, bandsaw, hand planer and jointer, tool grinder, and

(*Continued on p. XVIII.*)

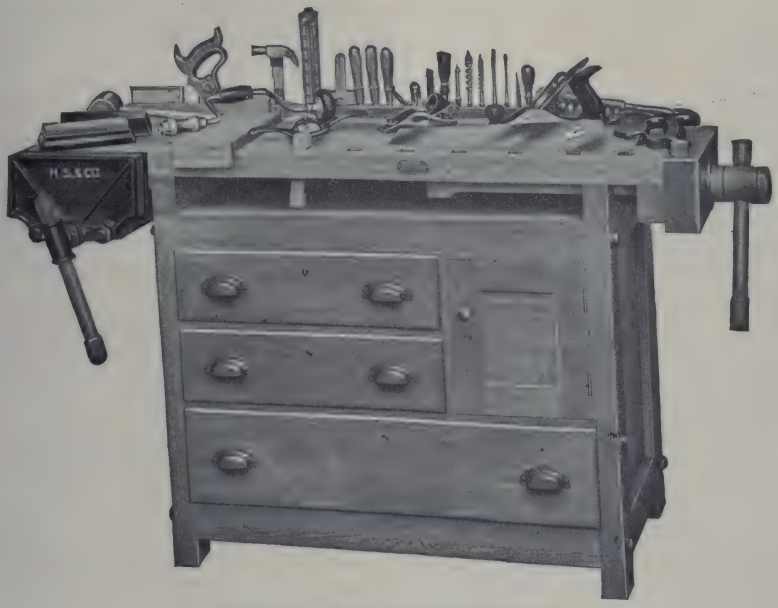


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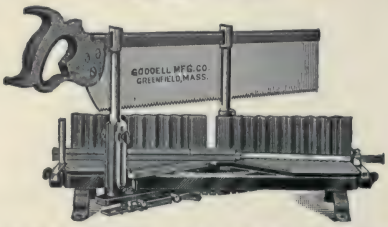
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FIELD NOTES.

(*Continued from p. XIV.*)

three wood-turning lathes. These machines are all individual motor-driven. William A. Ryan, supervisor of manual training, has introduced cabinet making and pattern-making this year.

Under the title of "Typical Occupations," the Society for the Promotion of Vocational Guidance and Occupational Guidance, California, have arranged a year's program. The subject discussed at their October meeting was "Office Occupations for Men and Women," and at the November meeting "Electrical Work."

The observance of Child Labor Day on January 22, 23 or 24 is being urged by the National Child Labor Committee. The purpose is to build up such a strong sentiment against child labor that a federal child labor law will be enacted, and thus prevent the present waste of the children of America.

On December 4th, Reading, Pennsylvania, had one of the largest educational conferences held in Pennsylvania this year. The meeting was held under the auspices of the Schuylkill Valley Schoolmasters' Club, who invited the Northampton Teachers' Club, the Valley Art Association, and the Continuation School Teachers' Club of Eastern Pennsylvania, as their guests.

Franklin B. Gill is acting director of industrial arts in Reading, Pennsylvania, since Wallace E. Hackett was appointed a state supervisor. J. Herbert Kissinger has recently been appointed teacher of electrical work in the high school for boys.

On January 1 the city of Philadelphia will be prepared to furnish continuation classes for the 15,000 to 18,000 children between 14 and 16 years of age, in compliance with the law which goes into effect on that date. It has been estimated that the total amount needed for teachers' salaries in the new classes will be $125,000.

Mauch Chunk, Pennsylvania, has converted one of the class rooms in the high school building into a domestic science kitchen and has fitted it up with a complete equipment. The girls of

(*Continued on p. XX.*)

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PRIZE WINNERS
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as awarded by

Henry Turner Bailey, Editor School Arts Magazine

CLASS I—BOYS IN HIGH AND TRADE SCHOOLS.

First Prize—Jerome Marx, Revere, Mass.

Second Prizes—L. John Block, Cincinnati, Ohio; Robert D. Dibble, Brookings, S. Dakota; Raymond Coe, Bridgeport, Conn.

Third Prizes—Clinton Coe Bridgeport, Conn.; Walter Diamond, Wilkinsburg, Pa.; Cedric Carman, Elwyn, Pa.; Leon B. Habecker, Buffalo, N. Y.; Oscar W. Larsen, Muskegon, Michigan.

Fourth Prizes—Jake C. Kloor, Crowley, La.; Dale K. Lundy, Indianola, Ia.; R. T. Puckey, Wheaton, Ill.; Harry Clark, South Acton, Mass.; Leo Cable, Akron, Ohio.; Fred Harrison, Fordyce, Ark.; W. Simmons Tyler, Bangor, Me.; Roy Beech, Dayton, Ore.; Willard A. Kates, Arlington Heights, Ill.; Arthur Bradford, Marion, Ind.

CLASS II—BOYS IN ELEMENTARY GRADES.

First Prize—Fletcher, Ernest and Milton Agnew, Glen Ellyn, Ill.

Second Prizes—Wm. Morgan, St. Johnsbury, Vt.; Marion Haskins, St. Johnsbury, Vt.; Howard Bronson, Riddle, Ore.

Third Prizes—Myron Gwinner, Lexington, Mo.; Phillip Keast, Grass Valley, California; Roy Demart and Ralph Stine, Tyrone, Pa.; Arthur Anderson, Carson City, Nev.; David Rosenthal, Buffalo, N. Y.

Fourth Prizes—Homer Williams, Pittsburgh, Pa.; George Caton, Swissvale, Pa.; Winthrop Bronson, Riddle, Ore.; William Brom, Kensal, N. Dak.; Wm. Morgan, St. Johnsbury, Vt.; Sylvester Paino, St. Johnsbury, Vt.; Raymond McFarlin, St. Johnsbury, Vt.; Clayton Silsby, St. Johnsbury, Vt.; John Brodien, St. Johnsbury, Vt.; Melvin Ellis, St. Johnsbury, Vt.

CLASS III—BOYS NOT IN SCHOOL.

First Prize—Paul Junghans, Jr., Ft. Atkinson, Wis.

Second Prizes—Nicholas O. Leon, New York, N. Y.; Warren Paris, Urbana, Ill.; George Roth, Gadshill Sta., Ontario.

Third Prizes—H. A. Lindberg, Boston, Mass.; Gerald Harper, Macksville, W. Va., Peter Oppewal, Clymer, N. Y.; Wm. S. Becker, Bethesda, Md.; Clarence E. Smith, McKenzie, Tennessee.

Fourth Prizes—Arthur N. Heise, Hamlin, Kansas; George M. Arnott, Cambridge, N. Y.; Horace Turner, Walsenburg, Colorado; Ralph Markle, West Hurley, N. Y.; Albert Minck, Danbury, Conn.; Henry Taylor, Winchester, Ill.; Clarence Sterenberg, Muskegon, Mich.; Joseph L. Seiler, Forestville, Wis.; Peter Dalina, New Britain, Conn.; Harvey Jellies, Glen Ellyn, Ill.

We take pleasure in announcing the above list of prizes. We have been surprised at the response to our contest. We have had applications for no less than four hundred specification blanks, and specifications of work were submitted from all parts of the country. We only regret that we could not give prizes to every boy who took part, but hope those who did not succeed will try for the next prize. The next contest closes January 1st. Address Dept. 3 for particulars of the prize contest and specification blanks.

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FIELD NOTES.

(*Continued from p. XVIII.*)

the seventh and eighth grades and the high school receive instruction in cooking under Miss Helen Ross.

The school district of Steelton, Pennsylvania, started a course in carpentry for the seventh and eighth grades and high school boys. I. C. Folker, formerly of Lebanon, is the instructor.

In Attleboro, Massachusetts, arrangements have been completed whereby boys from 11 to 16 years of age attending school may have an opportunity to visit all the factories in Attleboro. They will spend enough time in each factory to learn quite a little about the various processes of manufacture.

Lebanon, Pennsylvania, is erecting a $200,000 high school building. Plans for the boys manual arts work includes carpentry, wood-turning, and machine shop, two stock rooms, mechanical drawing room, and freehand drawing room; for the girls there will be a sewing room, kitchen, dining room, bed room, and a freehand drawing room.

The board of education in Cincinnati, Ohio, has notified all manual training teachers that they will be held personally responsible for injuries sustained by pupils while under their charge.

Paul B. Langan, formerly a teacher of shopwork in the practical arts department of the Reading school district, has accepted a similar position in the Thorne High School for Boys, Evans City, Pennsylvania.

The $700,000 high school building at Allentown, Pennsylvania, is nearing completion. It will house some of the best industrial shops in the state.

Isaac Doughton, superintendent of schools, Phoenixville, Pennsylvania, has introduced in the high school a course in practical arts which includes carpentry, freehand and mechanical drawing, sewing and cooking.

Next year Kansas City, Kansas, will open the first of a series of junior high schools.



This bench is admirably fitted for sectional classes.

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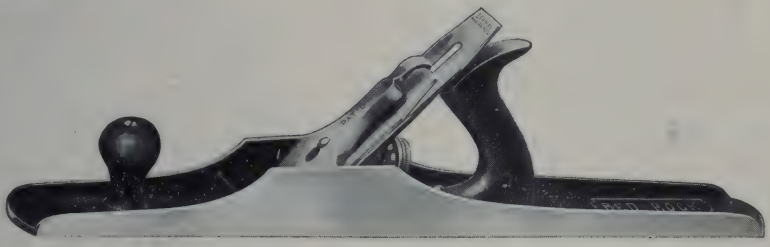
Kewaunee Equipment is different from any other Manual Training furniture you have ever seen. It is not rough and uncouth—it stands alone in being built and finished as well as skillful workmen know how.

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Full information gladly supplied.

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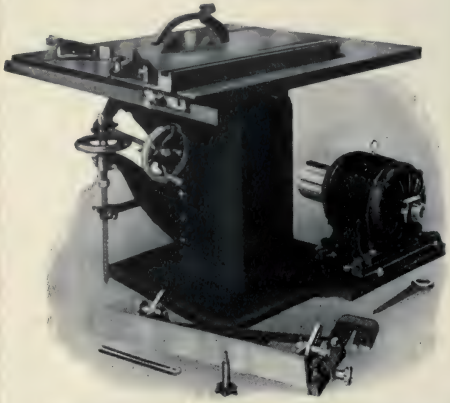
We are constantly receiving words of commendation for the change made in the design of these Planes, whereby they may be adjusted for a wide or narrow throat opening without removing the cutter or lever.

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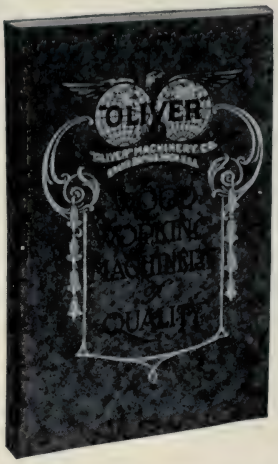
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Proper manual training without just the right tools is like teaching arithmetic with inaccurate examples.

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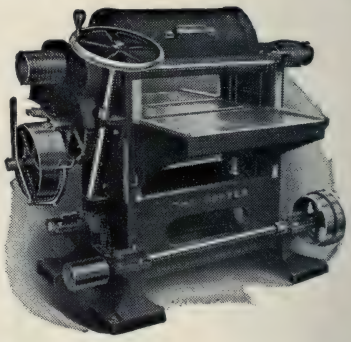
For Manual Training

are not only accurate—in design, quality, but perfectly adapted to your work. Their best recommendation is the attempts made to imitate their name and appearance as closely as the law allows.

Send for booklet showing complete line of pliers, glass cutters, chisels, hack saws, bits, snips, etc.

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"The Porter" Single Surfacer



Made in 20" and 24" sizes Well, safe guarded, a strong, well built machine that will do probably all and more work than you have and sells for from $135.00 and up.

We are willing to send you the machine on 30 days trial and if you are not convinced that it is a big bargain for the money, you may return it at our expense.

C. O. Porter Mach. Co.
Grand Rapids, Mich.

TRADE NOTES.

The Enterprise Company, Columbiana, Ohio, has recently placed on the market a speed lathe shown on page VII which callenges the attention of manual training teachers. After making a study of the requirements of such a machine, assisted by the most prominent supervisors of manual training, every feature of design that has caused annoyance in machines of this class now in use has been overcome.

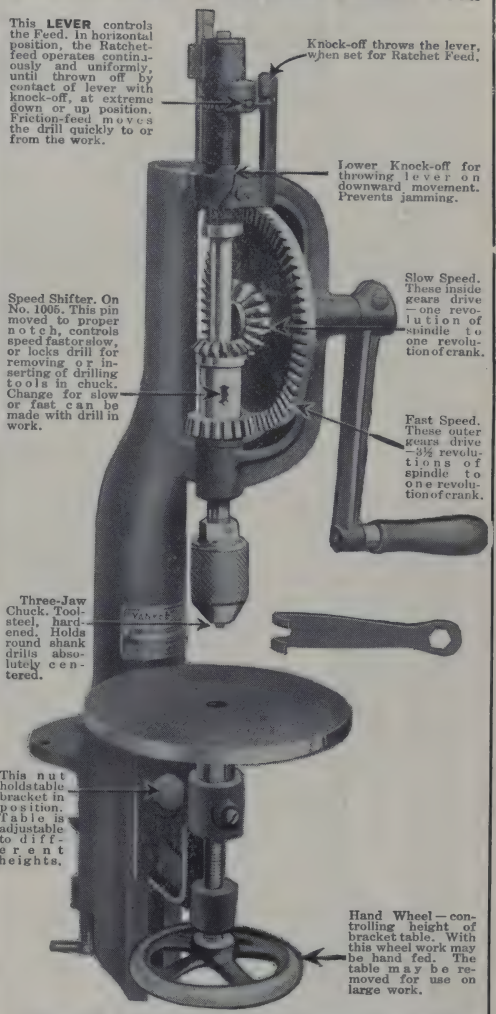
This lathe is designed for either motor or group drive. When motor driven, either direct or alternating current motor is mounted in cabinet leg, where it is protected from dust and shavings. The cone driving pulley is attached to the motor shaft, which is supported at the outer end by an adjustable bearing. The belt is easily and positively shifted over the various cones, by an accessible hand lever in front of the machine. The idler pulleys are fitted with ball bearings, and so arranged as to keep constant and even tension on the belt. In the event it is desired to stop the machine, a latch is provided on the shifting lever, which removes the tension from the belt. A brake is also provided for quick stopping. The head stock is cast separate from the bed, and is equipped with the latest type of self-aligning ball bearings.

A desirable feature that will appeal to many instructors is the quick acting adjustable eccentric clamping devise fitted to the tool rest and tail stock; by means of this type of clamping the bed can be cross-girted every 8 inches, which eliminates all vibration. The tail stock is of the boxed design, fitted with screw spindle, giving the greatest range of travel. The cabinet leg at the end of the bed is fitted with two shelves to receive tools and parts for the lathe not in use. Another feature of the cabinet legs is the extreme rigidness obtained, not to be had with any other type of lathe. Thus this lathe is credited with having less vibration than anything that heretofore has been on the market. The machine is furnished with usual equipment.

The manufacturers will be glad to furnish additional details to readers of this magazine. This Company has manufactured woodworking machinery for nearly half a century.

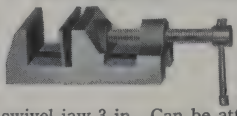
The "Line-O-graph" is a unique instrument manufactured by the Earl J. Early Company,

"Yankee" Bench Drill
with Automatic Friction-and-Ratchet Feed



Saves drills, gives more speed, has larger capacity than any other bench drill. Absolutely accident proof, can't jam or strip the threads, or break the gear teeth. Automatic, uniform feed for large and small drills.

No. 1005—Height 28"—Holds drills up to ½" diam. Two speeds.
No. 1003—Height 18¾"—Holds drills up to ¼" diam. One speed.



"Yankee" Vise No. 990

To hold small work on "Yankee" Bench Drill Table. Swivel, steel jaw for taper work 2⅝ in. open; without swivel jaw 3 in. Can be attached to work bench.

YOUR DEALER CAN SUPPLY YOU—

"'Yankee' Tool Book" for mechanics and handymen and "'Yankee' Tools in the Garage" for motorists. FREE.

North Bros. Mfg. Co., Philadelphia

"YANKEE" TOOLS
Make Better Mechanics



TRADE NOTES.

(*Cntinued from p. XXIII.*)

Philadelphia. In one tool we have a 45° triangle, a 30°-60° triangle, an irregular curve, and a protractor. It was first brought out about two years ago, and in this time has made a place for itself in many educational institutions as well as various industries. It is made in four sizes to meet differing needs.

Mummert-Dixon Company, Hanover, Pennsylvania, have just issued a complete descriptive circular of their oilstone grinders. The halftone illustrations include several varieties of grinders and clearly show the special features of each. Those interested in grinding equipment will find this circular a timely help.

A new planer for furniture factories has just been brought out by Hall & Brown Wood Working Machine Company, St. Louis. It is an extra heavy medium size machine with all-driven roll feed, equally adapted for use on hard and soft woods. Complete details will be sent on request.

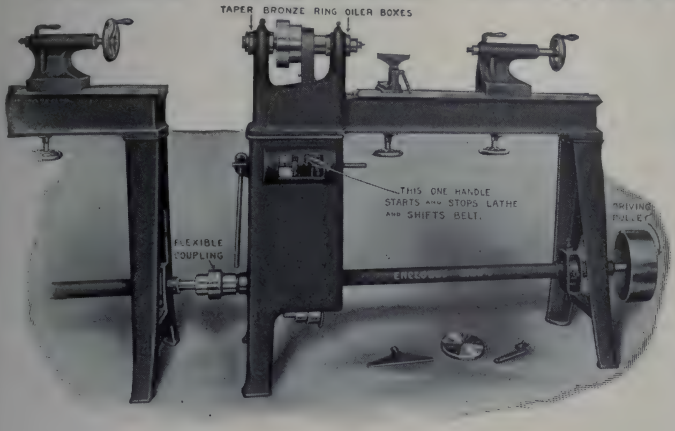
Interest in inlay work is developing in the schools and teachers will be glad to be pointed to literature on the subject. "Practical Inlay Work," by O. J. Palmer, has just been published by the Peerless Publishing Company, Mangum, Oklahoma.

Dependable manual training, sloyd, and stencil knives are manufactured by Robt. Murphy's Sons Company, Ayer, Massachusetts. Sixty-five years' experience in manufacturing high grade cutlery, enables them to produce goods that will stand the wear and tear of school use.

It often occurs that additional special teachers are sought in the middle of the school year. If any one of our readers can qualify as a teacher of plastering, including ornamental plastering, he will be interested in the position offered by the Engineering Agency, Chicago.

The Educational Equipment Company, New York, is the eastern agent for Orr & Locket Hardware Company, Chicago. They are showing domestic science and manual training equipment in their display rooms, and invite visitors to inspect their goods.

WELLS MANUAL TRAINING LATHES



WELLS Shaft Underdrive Lathe with Single Handle Control

SAFETY AND SIMPLICITY—

That is what all supervisors and instructors want and must have in a Manual Training Lathe.

THE NEW "WELLS" LATHE with the SINGLE HANDLE CONTROL

has no equal in those and other essential features. We welcome investigation and comparison.

ONE HANDLE does it all—Starts the Lathe—Stops it—Changes the Speed. (4 changes). Could anything be simpler?

All Moving Parts carefully guarded. Cover also furnished over Upper Cone Pulley if desired. You don't need to worry about the boys getting hurt when operating "WELLS" Lathes.

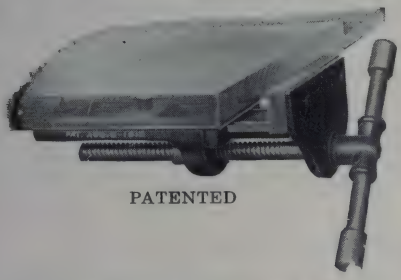
Single Handle Control on both Shaft Underdrive and Motor Underdrive Lathes.

Demonstrator's Lathes with either Outside Face Plate, Tripod and Tee Rest or Hand Feed Carriage or both.

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THE BEMIS STANDARD VISE



PATENTED

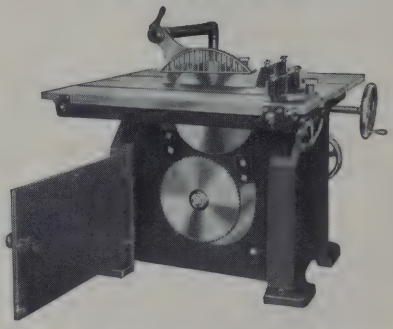
This vise has a novel self-aligning nut which is loosely held in a pocket on the plate supported by the fixed jaw. This feature is particularly covered by a patent of the United tates, dated August 6, 1912. The user of an infringing device is liable for infringement equally with the manufacturer and seller. The public is hereby notified that the patentee will take all necessary steps to protect his rights.

Send for circular.

A. L. BEMIS

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When you buy this machine you are not getting poor workmanship or skimped construction. You are getting the very best value that is made in this type of machine and we will gladly prove it to you by shipping one on 30 days' trial.

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Manual Training
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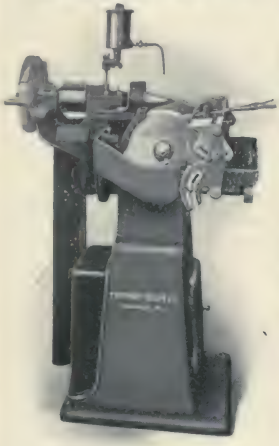
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MUMMERT-DIXON COMPANY
HANOVER, PA.

Oliver Machinery Co., Ltd., Manchester, England, sole agents for Great Britain.

CABINET HARDWARE AND CRAFT SUPPLIES

Catalogs 10, 12, 14 and 15
Two pages of designs in No. 15

The Thos. K. Lewis Co.

204 E. Tompkins St.
Columbus - Ohio

TRADE NOTES.

(*Continued from p. XXIV.*)

The Bemis Standard Vise, patented and manufactured by A. L. Bemis, Worcester, Massachusetts, has meet with such favor and consequent wide-spread use that it has necessitated increased facilities for manufacture in order to keep up with the demand. Several vises of similar nature have been put on the market during the last few years, but they do not have the special feature which characterizes the Bemis vise, namely, the self-aligning nut loosely held in a pocket. This feature is protected by patent.

During the next few months the equipment problem will receive much attention at the hands of teachers and directors in manual training, vocational and industrial schools. To be ready for the opening of school in the fall often means months of previous planning for new equipment. Among the firms that will likely notice a very greatly increased impetus in their line are the printing equipment manufacturers. Printing is rapidly being introduced in both the grades and high schools.

Workers in the jewelry arts will be interested in the offer of Louis J. Deacon, Warrenton, Virginia. One is often in doubt as to the stone most suitable for a given piece of jewelry, and appreciates an opportunity to try out several stones. By this means one can also add to his fund of information about the stones native to this country. Not all the beautiful stones are imported and it is well for us to know our own products.



Illustrated Working Drawings of Type Models in Wood Working

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A set of 20 high school plates (not illustrated) ...30c
Single Plates (illustrated) each..... 2c
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J M. JAMESON, EDITOR
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We list below the titles of the texts and manuals on Drafting and Design, which are included in this Series. Our complete catalogue of the Wiley Technical Series will be sent free, on request.

MECHANICAL DRAFTING (Just Published)
By CHARLES B HOWE, M. E.
An elementary and fundamental text-book written for the purpose of assisting the student to a knowledge of the principles of mechanical drawing and their practical applications.
147 pages, 8x10¾, illustrated. Cloth, $1.75 net.

AGRICULTURAL DRAFTING
By the same author.
A text-book on the principles of mechanical drawing for students in agriculture comprising text and problems.
63 pages, 8x10¼, illustrated. Cloth, $1.25 net.

AGRICULTURAL DRAFTING PROBLEMS
By the same author
A manual for students of agriculture to supplement the text in agricultural drafting.
26 plates, 8x10½. Paper cover, 50 cents net.

ARCHITECTURAL DRAFTING
By A. BENTON GREENBERG, B. A., in collaboration with CHARLES B. HOWE, M.E.
A text-book on the principles of architectural drawing for students and teachers.
110 pages, 8x10½, illustrated. Cloth, $1.50 net.

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A manual for students of architecture to supplement the text in architectural drafting.
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By JOSEPH CUMMINGS CHASE, College of the City of New York.
A text-book of practical methods.
73 pages, 8x10¾, illustrated. Cloth, $1.50 net.

FREE EXAMINATION OFFER—Special Terms to Teachers

Copies of any of the above books will be sent for free examination, with a view to their use in your classes. No cash is required in advance, and you have the privilege of returning them if found unsatisfactory.

JOHN WILEY & SONS, Inc.

432 FOURTH AVENUE **NEW YORK CITY**

London, Chapman & Hall, Ltd. **Montreal, Can., Renouf Pub. Co.**

BOOK NOTES

The reports of the Cleveland Foundation Survey are being published in very attractive little bound volumes. The following have already appeared: *Child Accounting in the Public Schools,* by Leonard P. Ayres; *Health Work in the Public Schools,* by Leonard P. Ayres and May Ayres; and *What the Schools Teach and Might Teach,* by Franklin Bobbitt. The price of the full series is $7. The address of the Cleveland Foundation is St. Clair Avenue and East Sixth Street, Cleveland, Ohio.

Country Plumbing Practice, by William Hutton, is a timely book published by David Williams Company of New York City. It gives a great deal of attention to gasoline engines and pumps and other machinery used in modern water supply systems for country homes and other buildings which must be independent of a city system of water supply and sewage.

A book which is sure to receive a warm welcome in many quarters is *Agricultural Drawing and Design for Farm Structures,* by Professor Thomas E. French, of the Ohio State University and Professor Frederick W. Ives of the same institution. It will be welcomed, in the first place, because the subject is new, and the field is growing rapidly each year. Then it will be welcomed because of the reputation of Professor French who is the author of two popular technical books, *Engineering Drawing* and *Essentials of Lettering.*

FARM WOODWORK.

There is every reason to believe that *Problems in Farm Woodwork,* by Samuel A. Blackburn, just published by the Manual Arts Press will meet the need that has been growing very rapidly for a collection of really practical projects adapted to rural life. In producing this new book every effort has been made to have it high grade in every particular.

In the first place, the author was born on an Illinois farm and lived there until his success in school work took him away. Then he graduated at the Illinois State Normal University and later in the teachers' course at Bradley Institute. Meanwhile he had acquired the trade of a carpenter. Then he became a teacher of manual training at the Spring Valley high school in Minnesota, and during the summer vacations worked at house and barn building. In seeking practical problems for his farm boys to work out in the school shop he came to realize the need for a comprehensive collection of farm problems but he could find none. This led to a more extended search for such problems, then to reducing them to drawings and studying out the best methods of teaching their construction. Finally, the result was the present volume.

As stated in the preface, the aim of the book is "to place before the teacher and pupil the best forms, the best construction and the correct dimensions of objects that can be correlated with work in agriculture." Then he adds,

"In getting together these problems the author has consulted successful farmers, fruit growers, bee raisers, gardeners, carpenters, and other workmen in order to get the best type of each problem, and to make it simple, practical, and the best fitted for its particular use. He has designated kinds of material that may be bought from any lumber yard and hardware store, and has used only the commercial sizes of lumber."

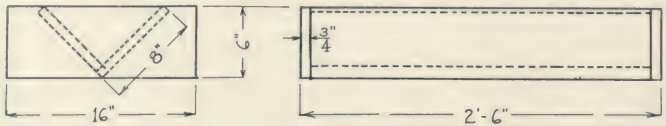
The plates in the book are excellent in draftsmanship, the lettering being in a clear attractive architectural style which is especially appropriate for a book on woodworking.

While the book has been written chiefly for rural high schools, agricultural schools and other schools and colleges giving courses in woodworking to students from the rural districts, it is also just what the farmer needs to help and encourage him in his winter shopwork at home.

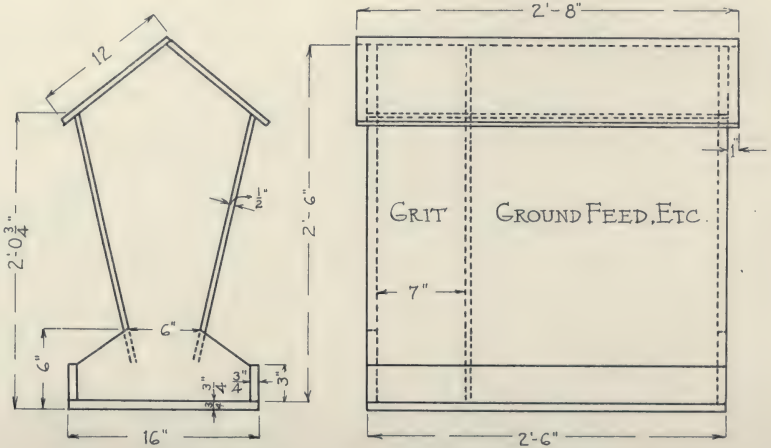
Architectural Drawing Plates, by Ralph F. Windoes, has been purchased by the Webb Publishing Company and will be incorporated in a book under the title *Architectural Drawing for High and Technical Schols.*

The latest book we have seen on metalwork is *Forging of Iron and Steel,* by William A. Richards, principal of the Grant Vocational High School, Cedar Rapids, Iowa. This is a textbook for college and secondary schools published by D. Van Nostrand Company.

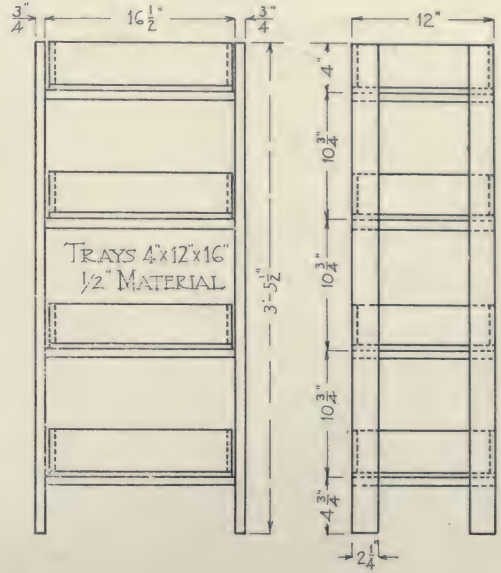
WATERING TROUGH



CHICKEN FEEDER



OATS SPROUTER



Sample page from "PROBLEMS IN FARM WOODWORK". XXX

See description on the opposite page.

JUST PUBLISHED

100 NEW PRACTICAL PROBLEMS in Woodwork which relate to agriculture and farm life.

PROBLEMS IN FARM WOODWORK

is the first book to successfully present a collection of problems in woodwork of equal value to the teacher of manual arts and agriculture, and to the boy on the farm. It is especially valuable to the pupil or teacher of agriculture or manual arts in rural schools and in high schools in farming communities. The author, Mr. Samuel A. Blackburn of Dallas, Texas, was formerly teacher of woodworking, forging and mechanical drawing in the Agricultural High School at Spring Valley, Minnesota, and supervisor of the teaching of woodwork in the associated rural schools.

Accompanying each of the 60 full-page plates of working drawings is a page or more of text relating to the problem and treating of "Purpose," "Material," "Bill of Stock," "Tools," "Directions" and "Assembly." The book designates only the kind of material that may be bought from any lumber yard and hardware store and uses only the commercial sizes of lumber.

TABLE OF CONTENTS

I. SHOP PROBLEMS.
- Sack Holder.
- Nail Box.
- Tool Carriers (two types).
- Saw Horses (three types).
- Handles—
  - Hammer; Pick; Sledge; File; Vise.
- Drawing Board.
- Miter Box.
- Tool Chest (small).
- Tool Chest.
- Nail Cabinet.
- Screw Cabinet.
- Work Bench.

II. POULTRY PROBLEMS.
- Rows of Nests for Laying Hens.
- Nest for a Sitting Hen.
- A-shaped Coop for Hen and Chickens.
- Box Coop.
- Chicken Feeder.
- Watering Trough.
- Oats Sprouter.
- Chicken Crate.
- Egg Tester.

III. SEED CORN PROBLEMS.
- Seed Corn Testing Tray.
- Frame for Testing Tray.
- Corn Tray for Exhibition Purposes.
- Seed Corn Crate.
- Seed Corn Rack.
- Cabinet for Seeds and Small Grain.
- Seed Corn Sled.

IV. YARD PROBLEMS.
- Bird Houses—
  - Chickadee; Tree Swallow; House Wren; Martin House.
- Frame for Hammock.
- Gates.
- Farm Gates; Garden or Yard Gate (two types).
- A Flight of Steps.
- Sawbuck.
- Rabbit Trap.
- Porch Swing.
- Dog House.

V. HOUSE PROBLEMS.
- Bench.
- Bread Cutting Board.
- Swing Board.
- Fly Trap.
- Ironing Boards (two types).
- Door Screen.
- Window Screen.
- Kitchen Table.
- Kitchen Sink.
- Kitchen Cabinet.

VI. GARDEN PROBLEMS.
- Tomato Trellis.
- Trellis for Small Vine.
- Row Marker.
- Shrub Label.
- Transplanter.
- Step Ladder.
- Fruit Picking Ladder.
- Potato Marker.
- Garden Marker.
- Cold Frame.

VII. STOCK PROBLEMS.
- Hog Troughs.
- Grain Trough for Feeding Sheep.
- Feeding Trough for Stock.
- Unloading Chute.
- Individual Hog Cot.

VIII. BARN YARD PROBLEMS.
- Milking Stools (four types).
- Evener.
- Singletree.
- Neckyoke.
- Wagon Box.
- Wagon Box Details.
- Spring Seat.
- Wagon Jacks (two types).
- Sand Box.
- Hog Coop (to fit wagon box).
- Hay Frame.
- Pigeon House.
- Brush and Curry-comb Cabinet for Barn.
- Scales and a Convenient Case for Weighing and Sampling Milk.

IX. BEE RAISING PROBLEMS.
- Bee Hive.
- Bee Hive Details.
- Bee Hive for the Amateur.

X. CONCRETE FORMS.
- Concrete Mixing Box.
- Form for Concrete Post.
- Concrete Form for Silo Foundation.
- Details of Silo Form Construction.

XI. OTHER PROBLEMS.
- Mouse Proof Cage for Agricultural Exhibits.

The drawings are clear, simple and complete and show a good standard of technique. See the sample page opposite this advertisement.

A WONDERFULLY PRACTICAL BOOK

Price, postpaid, $1.00

THE MANUAL ARTS PRESS - - - PEORIA, ILLINOIS

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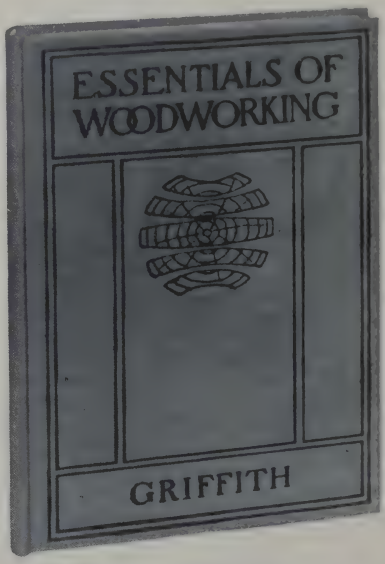
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AFTER HOURS

A HOLIDAY INCIDENT.

THE college doors had closed for the Christmas holidays. I was up unusually early the following morning, and was hurrying to take the first train home. The air was frosty, and I walked faster than usual—up our street to the top of the hill, and then down the street of elms and Colonial homes that led toward the public square. Never had I found the street so quiet. The loudest sound, and about the only sound, was that of my own footsteps. No one else was to be seen. The city below me was just waking from slumber; curls of light smoke were rising from chimney tops and making fairy figures for my exclusive pleasure as they reached the first horizontal rays of a winter morning sun.

I was drinking in the beauty of the scene when, as I turned into another street that led more directly to the station, I saw coming toward me the slight form of a girl about eleven years of age with a dull colered shawl over her head and a basket on her arm. When we met she stopped, looked up to me and said in a plaintive voice, "Please, sir, won't you give me some breakfast? I am hungry."

I do not know which it was that surprised me most, the unusualness of the request, the sudden let-down from my joy in the glorious sunrise, or the appealing face of the girl before me. Probably all three worked together. At any rate, I was sure there was something both winsome and pathetic in the face and figure of the girl. With a few more years she might have served well as the model for an Italian madonna. My sympathy was at once aroused and my hand started toward my money purse when, as I looked into her basket I noticed a paper bag that seemed to be well filled. "What have you in the paper bag?" I asked. "Crackers," she replied, and then dropping her eyes she added peevishly, "but I don't like crackers."

I realized with a shock that this little girl was a professional beggar, probably employed to gather food for indolent or worse parents. I was, however, a bit relieved to know that although she could beg most skilfully, she could not yet tell a lie. I went on my way, but the experience of those few seconds made such a deep impression upon me that they are fresh in my memory even thirty years after.

What shall be said of the parent who trains his daughter in such a school, and what shall be said of social conditions, especially in America, that tolerate such and even greater wrongs being wrought upon innocent children? Every American child has a right to something better by virtue of his birth in this land of ideals and education.

BEHIND THE TIMES.

IT is not always pleasant to tell a man that he is old-fashioned or behind the times, and I fear it may be more unpleasant to tell him just how many years behind he really is. Figuring on the basis of the present "up-to-the-minute" kind of competition in some phases of vocational school work, any school principal who is not having sewing and garment making taught in his school is just 97 years behind the equally progressive Englishman who was in charge of one of "Bells' School in Manchester," when visited by a New York teacher during the school year 1818-19. Professor John Griscom in his *A Year in Europe*, (Vol. 2, p. 533) tells us that the girls in this school were taught "not only to sew and knit, but to cut out the more necessary parts of wearing apparel." Then he adds, "too many females, especially among the labouring classes, are totally ignorant of the art of making the most simple article of dress."

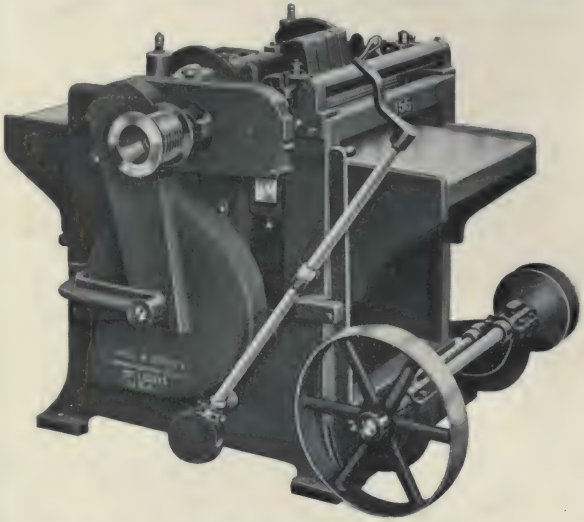
If this is not sufficient proof, Mr. Principal, that you are behind the times, we will attempt to give you an earlier date with volume, page, publisher and author complete.

IN these days of phonography, stenography and stenotypy it is not surprising that inquiry should come for "Wood inforced by Noise" instead of "Wood and Forest by Noyes."

I told Harrington about it, and he said that to him it was perfectly clear that the man who made that inquiry was strictly up-to-date in his pedagogy.

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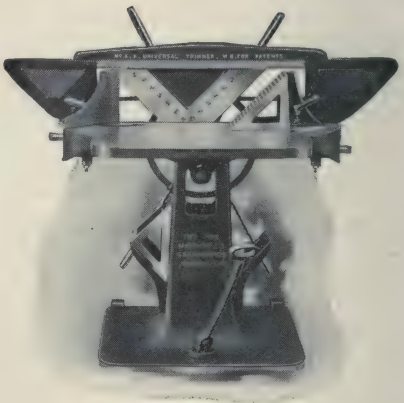
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VOLUME XVII NUMBER 6

MANUAL TRAINING AND VOCATIONAL EDUCATION

FEBRUARY, 1916.

THE NEED OF AN INDUSTRIAL EDUCATION IN AN INDUSTRIAL DEMOCRACY.

JOHN DEWEY.

THE need for industrial education may be approached from many standpoints. Industrial education may be treated as an indispensable factor in material prosperity, or as a factor in promoting the ability of a nation in the competitive race for commercial supremacy among nations—a point of view from which the example of Germany is urged. Or it may be regarded from the standpoint of its effect upon the contentment of the workers, or as a means of providing a more stable and efficient set of employes, and reducing the waste now found in most manufacturing enterprises. All of these things have their importance. But they all look at education as an instrument for external ends, and they pass lightly over that part of the subject represented in our title by the words, "education in an industrial democracy." The standpoint from which we are to approach the matter is, in short, that of the demands laid upon education by the need of fostering democracy in a country largely industrial, and where the need of making the spirit of democracy permeate industry is recognized.

Hence, a few words about democracy itself seem to be called for. Democracy has its political aspect. Probably this is the first aspect to present itself to view. Politically, democracy means a form of government which does not esteem the well-being of one individual or class above that of another; a system of laws and administrations which ranks the happiness and interests of all as upon the same plane, and before whose law and administration all individuals are alike, or equal. But experience has shown that such a state of affairs is not realizable save

where all interests have an opportunity to be heard, to make themselves felt, to take a hand in shaping policies. Consequently, universal suffrage, direct participation in choice of rulers, is an essential part of political democracy.

But political democracy is not the whole of democracy. On the contrary, experience has proved that it cannot stand in isolation. It can be effectively maintained only where democracy is social—where, if you please, it is moral. A social democracy signifies, most obviously, a state of social life where there is wide and varied distribution of opportunities; where there is much social mobility or scope for change of position and station; where there is free circulation of experiences and ideas, making possible a wide recognition of common interests and purposes, and where there is such an obvious utility of the social and political organization to its members as to enlist their warm and steady support in its behalf. Without ease in change, society gets stratified into classes, and these classes prevent anything like fair and even distribution of opportunity for all. The stratified classes become fossilized, and a feudal society comes into existence. Accident, rather than capacity and training, determine career, reward, and repute. Since democracies forbid, by their very nature, highly centralized governments working by coercion, they depend upon shared interests and experiences for their unity and upon personal appreciation of the value of institutions for stability and defense.

Such qualities as these, such qualities as insistence upon widespread opportunity, free exchange of ideas and experiences, extensive realization of the purposes which hold men together, are intellectual and emotional. The importance of such qualities is the reason why we ventured to call a social democracy a moral democracy. And they are traits which do not grow spontaneously on bushes. They have to be planted and nurtured. They are dependent upon education. It is no accident that all democracies have put a high estimate upon education; that schooling has been their first care and enduring charge. Only through education can equality of opportunity be anything more than a phrase. Accidental inequalities of birth, wealth, and learning are always tending to restrict the opportunities of some as compared with those of others. Only free and continued education can counteract those forces which are always at work to restore, in however changed a form, feudal oligarchy. Democracy has to be born anew every generation, and education is its midwife. Moreover, it is only education which can guarantee widespread community of interest and aim. In a complex society, ability to understand

and sympathize with the operations and lot of others is a condition of common purpose which only education can procure. The external differences of pursuit and experience are so very great, in our complicated industrial education, that men will not see across and thru the walls which separate them, unless they have been trained to do so. And without this lively and ardent sense of common life, it is hopeless to secure in individuals that loyalty to the organized group which needs to be an animating motive of conduct.

To recall these generalities, these commonplaces, would be idle were it not that there is a tendency to drop them from view when the topic of industrial education is under consideration. Its purpose is often thot to be so much narrower, more practical and technical, than the object of other established modes of education, that these features may be—nay, must be—left out of account. But the contrary is the case. Just because of the part played by industry in modern life, an education which has to do with preparation for it, must bear these considerations in mind more than other forms, if democracy is to remain an actuality. Just these things provide the controlling considerations for deciding the curriculums, methods, and administration of a system of industrial education.

There are many phases of industry, as at present carried on, which are unfavorable to a genuine democracy, just as, on the other hand, the development of modern industrial and commercial methods has been a chief factor in calling political democracy into existence and then endowing it with social aspirations. There are extreme divisions of work between the skilled and unskilled, and also between the most skilled workers on the technical side, whether inventors or doers, and the managers on the fiscal and marketing side. These tend to segregate men and women into exclusive classes. The difference on the side of consumption between those who can barely maintain a low standard of living and those who are relieved by circumstances from any responsible thot for expenditure, and who give themselves up to display and idleness, has never been as large or as overtly conspicuous as it is today. Older divisions of master and subject class tend to reinstate themselves in a subtle form.

Machine industry, moreover, tends to reduce great masses of men to a level where their own work becomes mechanical and servile. Work loses its intellectual and esthetic cast and becomes a mere necessity to procure the pay which buys daily support. The machine operator engaged in manipulation of a machine becomes identified with the monotongaged in manipulation of a machine becomes identified with the monotonous movements of the monster he tends. As long as he has to do new

things, he learns. The moment he has mastered his unchanging work it masters him; its habits absorb and swallow his. Employers whose methods have bred lack of initiative, and have practically forbidden workers to think, complain because men can not be found for places of greater responsibility. But the evils are far from being confined to the laboring class. When social responsibilities have at most to do with the expenditure of wealth, not with earning it, when business is pursued not as an exercise in social cooperation but as a means of power, the mind is so hardened and restricted that democracy becomes a mere name.

To recall such danger is to recognize some of the offices thrust upon industrial education in a democracy. To counteract the soulless monotony of machine industry, a premium must be put upon initiative, intellectual independence, and inventiveness. Hence schooling must not model itself upon the automatic repetitiousness of machines, whether in the name of the false gods of practical skill or discipline. Personal control of power, strong discontent with whatever subordinates mental capacity to merely external regulation, must be made primary. The imagination must be so stored that in the inevitable monotonous stretches of work, it may have worthy material of art and literature and science upon which to feed, instead of being frittered away upon undisciplined dreamings and sensual fancies. New inventions and applications of science are actively remaking technical and technological methods of industry. Hence the desire for immediate results and immediate efficiency must be held in check by the need of securing powers which will enable individuals to adapt themselves to inevitable change. Otherwise they will become helpless burdens on society as the methods in which they have been trained pass away. Moreover, since the worker is to be an integral part of a self-managing society, pains must be taken at every turn to see that instead of being prepared for a special, exclusive, practical service, as a hide might be prepared for a shoemaker, he is educated into ability to recognize and apply his own abilities, is given self-command, intellectual as well as moral.

Let it not be thot that this is a plea for the continuation of the older so-called "general education," on the ground that it also made its defense that it trained general capacity and brot the individual to a consciousness of himself and his surroundings. The material of this traditional general education is not adapted to the needs and activities of an industrial society. It was developed (as were its methods) in times when our present industrial society was not. The simple fact is, that no attempt has ever been made to discover the factors of scientific and social importance

in present-day industry and in a common democratic life, and then to utilize them for educational purposes; as was done by our spiritual progenitors in the work of selecting the factors of value in a non-industrial and feudal society so as to make them count for education. The work which has to be done by a system of industrial education in an industrial democracy is to study the most important processes of today in farming, manufacturing, and transportation to find out what are the fundamental and general elements which compose them, and thereby develop a new kind of general education on top of which the more special and technical training for distinctive vocations may be undertaken.

As a new subject-matter is needed, so are new methods. Our inherited instruction knows, in the main, two kinds of methods. One is that of habituation in various specialized modes of skill, methods of repetition, and drill, with a view to getting automatic skill. This is the method which is most likely to be resorted to in an unintelligent industrial training. It is adapted to securing mechanical proficiency in a narrow trade, but is no more adapted to the specific needs of industrial democracy than is the other inherited method—the theoretical and scholastic method of acquiring, expounding, and interpreting *literary* materials. What is needed is a recognition of the *intellectual* value of labor—the same kind of recognition of intellectual results in facts, ideas, and methods to be got from ordinary industrial materials and processes that the laboratory (significant name) has accomplished for a limited range of materials and processes. Or, put the other way about, what is needed is a development of laboratory methods which will connect them with the ordinary industrial activities of men. In that case, there will be no danger that the necessary personal insight and initiative will not be secured.

The value of the older humanistic methods was that they had a vital relation to human affairs and interests. But that is a reason for attempting to discover the humanism contained in our existing social life, not for the reverse policy of despising the present and taking flight to the past. I do not underestimate the difficulties in the way of taking a spiritual survey of our present industrial society and applying its results to education. Strong class interests stand in its way, for it would be sure to utilize education as a means for bringing to more general recognition the evils and defects of present industrial aims and methods, and in making more wide-spread a knowledge of the means by which these evils are to be eliminated. An effective study of child labor, of the

sanitary conditions under which multitudes of men and women now labor, of the methods employed in a struggle for economic supremacy, of the connections between industrial and political control, and of the methods by which such evils may best be remedied, is a need of any education which is to be a factor in bringing industrial democracy out of industrial feudalism. But to propose this is to invite the attack of those who most profit by the perpetuation of existing conditions. Yet since this knowledge is an obvious concern of the masses, and we have already a political machinery adapted for securing control of the masses, this spirit is bound in the future to animate our educational system. In the universities, in spite of their seeming closer connection with existing economic forces, this scientific spirit has already come into education. As the merely propagandist and merely philanthropic spirit give way to a scientific spirit, it will find its way also into lower education, and finally become a part of the working mental disposition of the masses.

It hardly needs to be said, in closing, that it is a need of industrial education in an industrial democracy that its administration be kept unified with that of ordinary public education. To make it a separate system, administered by different officers having different aims and methods from those of the established public school system, is to invite the promotion of a narrow trade system which shall in effect make the pecuniary, rather than the social and democratic, factors in industry supreme. The natural counterpart to free and universal public education is a system of universal industry in which there are no idlers or shirkers or parasites, and where the ruling motive is interest in good workmanship for public ends, not exploitation of others for private ends. This is the reason why industrial democracy and industrial education should fit each other like hand and glove.

NO QUESTION UNDER DISCUSSION IN EDUCATION IS SO FRAUGHT WITH CONSEQUENCES FOR THE FUTURE OF DEMOCRACY AS THE QUESTION OF INDUSTRIAL EDUCATION. ITS RIGHT DEVELOPMENT WILL DO MORE TO MAKE PUBLIC EDUCATION TRULY DEMOCRATIC THAN ANY OTHER ONE AGENCY NOW UNDER CONSIDERATION. ITS WRONG TREATMENT WILL AS SURELY ACCENTUATE ALL UNDEMOCRATIC TENDENCIES IN OUR PRESENT SITUATION, BY FOSTERING AND STRENGTHENING CLASS DIVISIONS IN SCHOOL AND OUT. —John Dewey.

INDIVIDUAL DIFFERENCES AND HOW TO PROVIDE FOR THEM IN THE MANUAL ARTS.

IRA S. GRIFFITH.

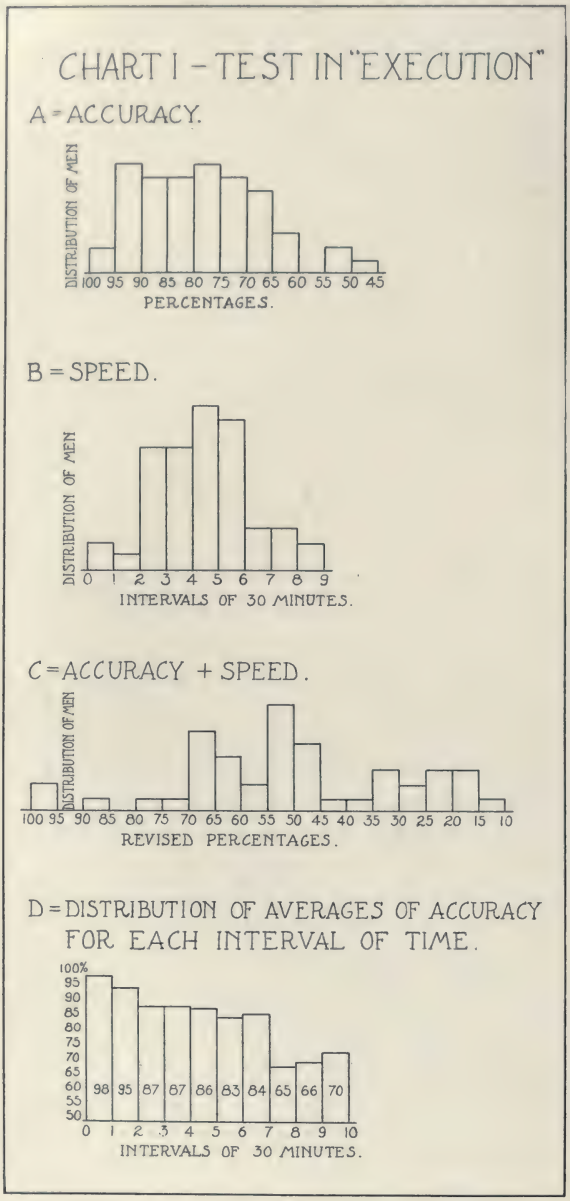
THE purpose of all education is the better preparation of the child to meet his environment, present and probable future, as judged by society.

What we shall teach is to be determined by social demands. How we shall teach is to be determined by child nature. The first will place emphasis upon subject-matter and logical arrangement; the second will place emphasis upon method and will be predominantly psychological in its aspects. The teacher's problem will consist in taking the child as he finds him and so surrounding him that he shall have "experiences" which, while securing his interest and satisfying his desires, shall make possible the engrafting upon this stock other and more remote interests and experiences such as society has determined as useful in enabling the child better to meet his environment, present and probable, both as an individual and as a member of the social group.

No two children are alike. No two children are entirely different in personal characteristics or social needs. Society does not demand that all of its members shall live the same kind of life. Neither, on the other hand, can it permit any child to be educated as if he were to live his life apart from that of his fellows. The more nearly the life of a child touches that of his fellows, the more will he find himself called upon to sacrifice his individualism to the welfare of the social group. That system of administration is best which provides for individual differences as much as can be done without excessive interference with the welfare of the social group. General education, of which technical manual arts is a part, can consider only the broad interests and experiences in life. Within any one such broad interest will be found infinite possibilities for variation. Organized subject-matter arranged for the greatest good to the greatest number is presumed as the right of technical manual arts, just as it is for other subjects, such as mathematics, and the languages. Individual differences are to be provided for just as far as can be consistent with reasonable rights of the group.

THE FACTS OF VARIATION IN THE MANUAL ARTS.

While the results of standard tests for the ratio of individual differences are easily available for academic subjects and indicate clearly that


CHART I - TEST IN "EXECUTION"
A = ACCURACY.
DISTRIBUTION OF MEN
100 95 90 85 80 75 70 65 60 55 50 45
PERCENTAGES.
B = SPEED.
DISTRIBUTION OF MEN
0 1 2 3 4 5 6 7 8 9
INTERVALS OF 30 MINUTES.
C = ACCURACY + SPEED.
DISTRIBUTION OF MEN
100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10
REVISED PERCENTAGES.
D = DISTRIBUTION OF AVERAGES OF ACCURACY FOR EACH INTERVAL OF TIME.
100%
95
90
85
80
75
70
65
60
55
50
98 95 87 87 86 83 84 65 66 70
0 1 2 3 4 5 6 7 8 9 10
INTERVALS OF 30 MINUTES.

the probability curve, so frequently applied to probable variation in the biological world is fully as applicable to probable variation in the educational field, as a matter of interest the writer ran a series of tests with a class of freshmen engineering students in woodwork.

Chart I-A is the graph of a test in which the aim was the determination of the ratio of variation in execution or accuracy or skill. The test consisted in squaring up a piece of stock to meet certain prescribed standards. Students were given stock of like dimensions. No new stock was given anyone beside this first piece to each man. No piece was accepted or passed until edges and ends were squared to the faces. Rankings were made according to the size of the piece of stock handed in, the student getting the required squareness with the fewest shavings removed ranking highest.

Chart I-B shows the variation of this group of men in the matter of speed in execution of the piece mentioned above.

Chart I-C indicates differences when students are ranked by combining the skill or accuracy of execution of each student with the speed or time ratio.

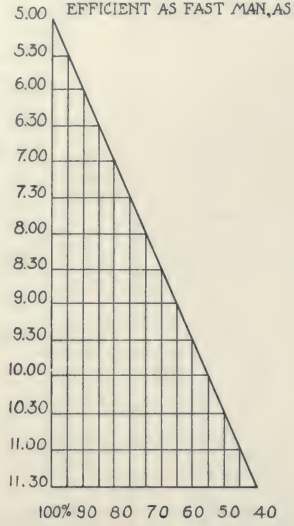
In combining speed with accuracy, both in execution and in technic tests, the following method was used: The time interval elapsing between the handing in of the work by the fastest and the slowest man was noted. Also each man was timed as he handed in his finished piece. The fastest man was rated at 100 per cent, that is, he was given 100 per cent of his marking for accuracy. The others were graded proportionately lower. The highest possible mark was 100, which would go to the best in accuracy provided he were also the fastest man, Fig. 1.

Chart II-D indicates that slowness is in no wise compensated for by increased accuracy. In fact, it will be seen that slow men are, as a general proposition, inferior to fast men in accuracy. This may easily be determined by averaging the accuracy grades for that portion of the class finishing during the first half of the time interval elapsing between the time of the fastest and the slowest man, and comparing this with the average of the portion finishing during the second half of this time interval.

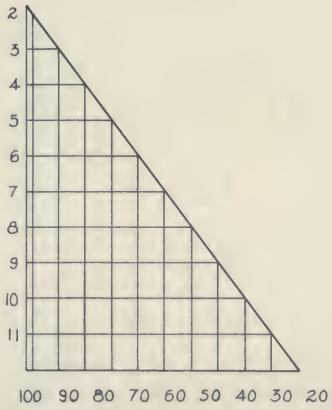
Chart II-A gives the results of a test for technic or accuracy of knowledge of tool processes connected with the shopwork. This test consisted of filling in a "blank word form," Fig. 2. The sentences were taken from the woodworking text made use of by the students in their regular work. They were supposed to be so familiar with the subject-matter that a missing word would be suggested by the context.

FIGURE I

GRAPH FOR EQUATING ACCURACY AND SPEED IN TECHNIQUE. SLOW MAN IS $\frac{5}{11.30}$ OR 44% (APPROXIMATELY) AS EFFICIENT AS FAST MAN, AS TO TIME.



GRAPH FOR EQUATING ACCURACY AND SPEED, CHART IV.



GRAPH FOR EQUATING ACCURACY AND SPEED IN EXECUTION. SLOW MAN IS $\frac{1}{3}$ OR 20% AS EFFICIENT AS FAST MAN, AS TO TIME.

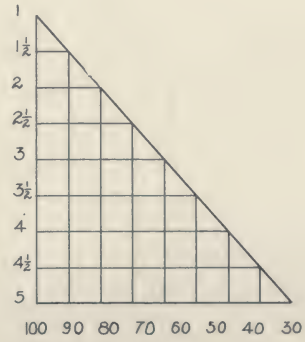


FIGURE II

Woodwork Ia. Name _____

An axe is a curve such that the sum of the distances from any point on it to two fixt points called the ~~ru~~ foci shall always be the same.

Oil is used on stones to cleanse the pores of the stone of the little particles of steel from the tool.

In sharpening the chisel, rub back and forth, keeping it at the same angle all the time.

Where one plane is to serve the purpose of smooth, jack and fore-plane, it should be ground ~~round~~ on edges. Where a full equipment of planes is at hand, the plane-iron of the jack plane is ground edges rounded a little.

The two parts of the try-square are the beam and the ~~b~~ stock. In testing the ends for squareness the ~~b~~ stock should be held firmly against the face edge and the face side.

The ~~foot~~ is used as the unit of measure in woodwork.

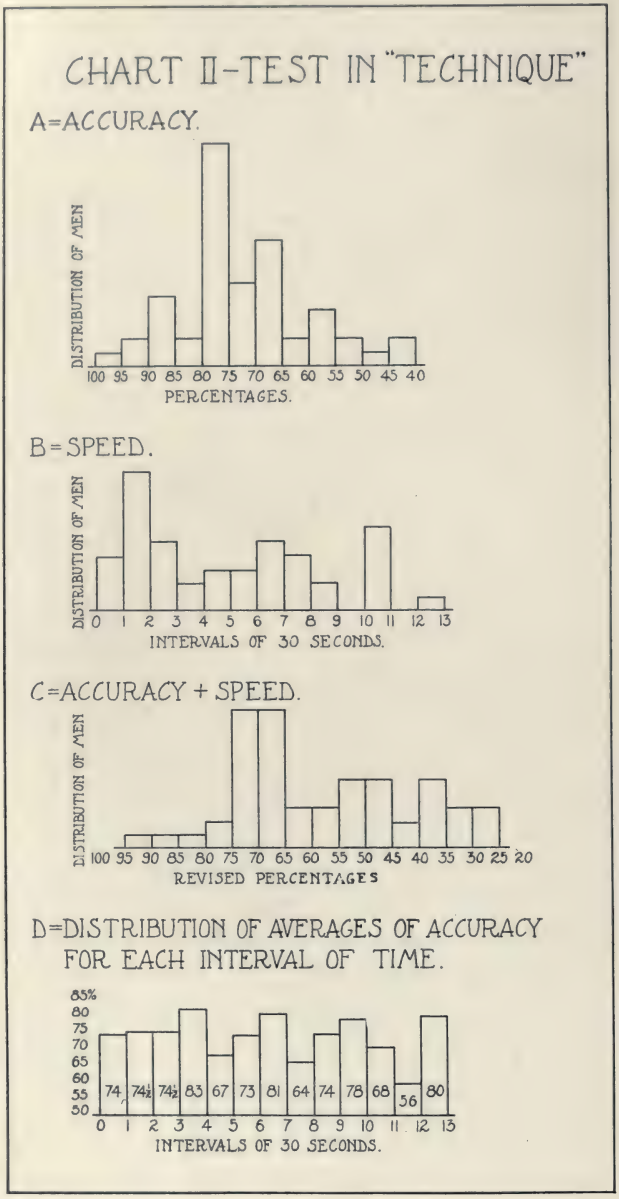
The four parts of the marking gage are: (1) beam; (2) ~~b~~ stem; (3) ~~b~~ stock; (4) block screw

Where a piece of stock is to have the edges and ends chamfered, chamfer the ~~s~~ side first.

To tell whether a bit is boring a hole in the direction which is wanted, it is necessary to sight the brace and bit in two directions.

The six parts of the auger-bit are: (1) ~~s~~ screw; (2) nibs; (3) lips; (4) tang; (5) ~~m~~ mouth; (6) _____

In edge planing it is necessary to get very fine shavings, especially on the last few strokes.

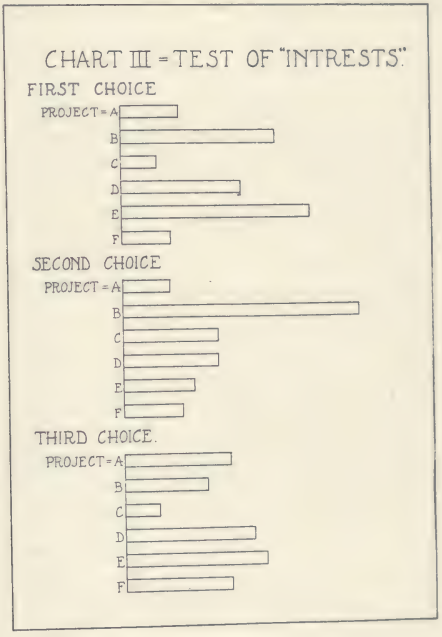

CHART II-TEST IN "TECHNIQUE"
A=ACCURACY.
DISTRIBUTION OF MEN
100 95 90 85 80 75 70 65 60 55 50 45 40
PERCENTAGES.
B=SPEED.
DISTRIBUTION OF MEN
0 1 2 3 4 5 6 7 8 9 10 11 12 13
INTERVALS OF 30 SECONDS.
C=ACCURACY + SPEED.
DISTRIBUTION OF MEN
100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20
REVISED PERCENTAGES
D=DISTRIBUTION OF AVERAGES OF ACCURACY FOR EACH INTERVAL OF TIME.
85%
80
75
70
65
60
55
50
74 74½ 74½ 83 67 73 81 64 74 78 68 56 80
0 1 2 3 4 5 6 7 8 9 10 11 12 13
INTERVALS OF 30 SECONDS.

The exact word was not required but the word given had to meet the demands of the context.

Chart II-B represents graphically the distribution of men in the matter of time required to fill in the blanks of Chart II-A. The papers were passed out face down. At a given signal these were turned over and the writing allowed to begin, each man being timed as his paper was handed in.

Chart II-C indicates the result of combining accuracy and speed in this test for technic.

Chart II-D offers additional proof that fast men are more accurate than slow men despite the additional time taken by the slow men in which to do the work. "Slow but sure" is more likely to mean "slow and not so sure," as a general proposition.

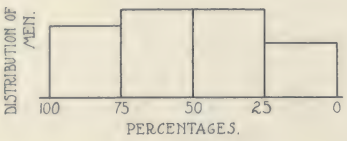


THE FACTOR OF CHOICE.

Chart III graphs the variations in interest as shown in choice of projects from a given group of woodwork projects. In this test no student knew what his fellows were choosing. That is, the influence

CHART IV—TEST OF ABILITY TO GENERALIZE SPECIFIC EXPERIENCES.

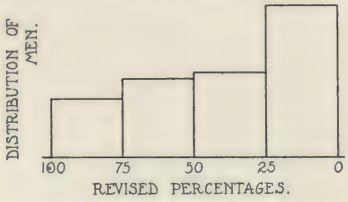
A=ACCURACY.



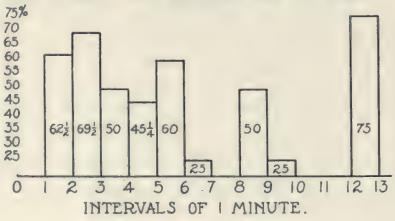
B=SPEED.



C=ACCURACY + SPEED.



D=DISTRIBUTION OF AVERAGES OF ACCURACY FOR EACH INTERVAL OF TIME.



of leadership, which in grammar grades and high schools is often sufficient to cause a section to pick upon one project almost solely, while another section choosing from the same offering will choose almost unanimously a different project, was not present. This matter of the influence of leadership upon interest is rather disconcerting to the uninitiated. Such a leader may or may not be strong in shopwork. As a general proposition, it is often sufficient that he hold the respect of his fellows for good judgment. Experiments seem to indicate that with certain classes a choice may be very narrow and be thoroly satisfying provided some opportunity for choice is present.

Chart IV is a graph of the ability of a group of students to generalize from specific experiences. After five weeks of six hours per week devoted to instruction and experience in (1) squaring up mill planed stock for exterior finish, (2) squaring up stock for interior finish, (3) complete squaring up of stock where rough sawed stock was used, (4) working stock where tangents and center lines were in evidence, the men were asked to state concisely the order of procedure in preparing a piece of work not exactly like anything upon which specific instruction had been given but so closely related that they should have had no trouble in "thinking out" the solution. The problem given was that of a one-piece end of a gabled bird box. The test consisted in noting which way they "ran the grain" and whether they would square up the gabled end before laying out and cutting the corners. The graphs indicate quite plainly that, in spite of a carefully organized course in which, seemingly, enough specific experiences had been provided to warrant the instructor in concluding that his students had generalized as to this material, too many students "failed to think."

It is highly probable that manual training makes its greatest failure at just this point—the taking for granted that "ability to meet new situations" is fully guaranteed when we have given our students a number of specific experiences differing from one another, as we think, sufficiently to warrant our presumption. The few limited, highly specific shop experiences in manual training are of little value in themselves. Only as these are generalized in the mind of the student are they of much value. If academic instruction has been too general, possibly some of our manual training has been just a little too specific—or, better, has failed to see that the specific experiences were generalized.

APPLICATION.

Let us make an application to the organization and teaching of elementary woodwork. According to principles stated we may organize

our subject-matter according to principles and processes. While in many cases the order of introduction of subject-matter should be sequential because of increasing difficulty, in many cases the exact order will be found immaterial. It makes little difference, for illustration, whether the plane or the saw is taught first. The essential thing is so to arrange the subject-matter that new processes and principles may have a gradual introduction. We speak, it should be said parenthetically, of technical manual arts—not of illustrative manual arts—of manual arts as an end in itself, and not as a means of teaching other subjects, as history, geography, and the like. We believe that illustrative manual arts is not called upon to pay much, if any, attention to organization of manual arts subject-matter.

Provision in technical manual arts must be made for varying ability of students in execution, in technic, in interests, and in ability to initiate. Such variations must not be allowed to interfere with class instruction and the orderly introduction of new subject-matter. This is best accomplished by what is known as the "group system." This system provides for the grouping of projects having similar tool operations. It is a grouping of processes and not of pupils; the class is the unit in grouping pupils. Chart V illustrates one such group in elementary woodwork.

CHART V.

FASTENING WITH NAILS OR SCREWS: DUPLICATE PARTS.

Time: 6 weeks.

Stock.	Processes.	Tools.	Projects.
Soft wood S-2-S ⅜″, ½″, ¾″	Duplicate parts Nailing Setting nails Fastening with screws	Hammer Nailset Screwdriver	Nail-box Polishing box Knife box Bird box Broom holder Bench hook

This system (1) permits class instruction upon processes involved in the group under consideration, making necessary but one demonstration for the whole class; (2) makes possible the assignment for study of definite related informational matter pertaining to the technic of the subject with opportunity for class recitation and discussion the following period; (3) permits any one pupil to satisfy his desires as to what he wants to make without interfering with the orderly presentation of

subject-matter, subject, of course, to the limitations of the grouping of processes. To illustrate: When a class is working in a group having the mortise-and-tenon joint with its applications, the members of the class, while not required to make any particular project involving the mortise-and-tenon joint, are not permitted to make at that time projects involving joints the introduction of which is planned for a later place in the course. Should a boy wish to make a piece involving a dovetail joint at such time, he is told that such project is out of place at that time, but that there will be a place for it somewhat later in the course. (4) Since a class remains working within a given group until the slow worker completes at least one project within that group, this system provides opportunity for the rapid worker to acquire additional facility in execution by making other projects within the group, such additional projects not requiring any additional explanation or demonstration upon the part of the teacher. (5) This system provides for the repeater who is required to take his shopwork over not because he is poor in shop but because of general weakness in academic work. True, he gets no new information as to technic, the tool instruction remaining the same from year to year in any given grade. He does get additional facility in execution and a chance to work upon projects other than those he worked upon in the same grade the preceding year.

There never has been a system of any kind to which objections could not be offered. There are objections to the group system. In the final analysis the test is not so much that there are objections, but whether they are so serious as to make some other system more efficient. Like every other scheme which seeks to make allowances for individuality, this scheme requires more mental effort on the part of the teacher and a better understanding of the subject taught.

Experience has shown that better results are obtained in technical manual arts, both in the development of ability to think and to execute, if the ability to execute is given a maximum of attention at the beginning of the course, opportunity for the exercise of initiative and original thinking being introduced gradually as the student's knowledge and appreciation of the problems involved and skill increase. In the beginning groups the sizes or dimensions of the projects offered may be set, no variation being permitted except as poor workmanship necessitates. Requiring all to make the same pieces in the beginning groups makes possible comparison of results and the setting of standards of accuracy, as well as making possible the giving of definite instruction with a minimum amount of talking upon the part of the teacher.

Another reason for emphasizing technic and processes at the begin-

ning is that interest is so easily directed. A beginner is interested in anything. Having taught the pupil to respect a working line, it will be time to encourage original thinking. This, because of the pupil's ignorance of processes, will come slowly if satisfactorily. Modifications of dimensions of projects offered may well comprise the first step toward originality. Pupils possessed of exceptional originality and ability will, before the newness or novelty of the shop experience has worn off, find ample opportunity for efficient expression in the group system when wisely administered without hindrance upon the part of slower neighbors and without requiring the attention of the instructor which should have been given to other students. The slow student has a right to an equal share of the instructor's time, and this is not always easy to give when the brilliant pupil has to be given individual instruction upon advanced work.

In general it will be found advisable to hold seventh grade pupils in woodwork quite rigidly to the execution of projects offered. We are presupposing the work to begin in seventh grade. In the eighth grade pupils should be encouraged to modify existing projects offered them, which projects are supposed to have been selected because of their probable interest to the boys, and because their construction is "within reason" for boys of that age and stage of development. In high school boys should be given every encouragement to "work up" original designs, subject to the limitations of the groups previously mentioned. By this time they should have acquired a fair fund of information and some judgment and appreciation of the technic involved in simple woodwork.

It is not possible to enter into greater detail of the group system. The result of nine years' experimentation with its application to woodwork and a description of the scheme of organization will be found in "Correlated Courses in Woodwork and Mechanical Drawing." Just now we are experimenting to determine whether the system of grading in which an average class is separated into 25 per cent superior, 50 per cent medium, and 25 per cent inferior is applicable to shopwork when speed or time is taken into consideration. The charts shown do not represent sufficient data for a generalization, but seem to prove that such a division is not at all unreasonable. One thing seems certain, the differences between high and low efficiency are much greater than is generally supposed.

CONCLUSION.

While the application of the group system has been illustrated by its application to elementary woodwork, it is equally applicable to any

other technical shop subject such as forging, pattern-making, machine-shop.

Are you an "individualist," insisting that no two souls are exactly alike, therefore individual instruction is the only method? Our government is not organized upon any such basis. A government based upon such principles would be no government at all; it would be anarchy. Are you a formalist, insisting that all pupils must attain the same standards and pass thru exactly the same experiences? A liberty loving people do not take kindly to such doctrine in any other organization. Let us make a study of individual differences, and see if we cannot formulate a manual arts system which will permit liberty within law educationally even as we have it governmentally.

Would you like to vary the sameness of your task? You know any task, however interesting, becomes more interesting when you change the point of view and make an attack from a little different angle. Teachers in the public schools are the only ones who can provide sufficient data on this question for generalizations worth while. We do not need to be highly expert to get some light upon some of these things. Suppose you try some of the simple experiments suggested, and see if, for example, your class will, as a general average for several years, fall into divisions of 25 per cent superior, 50 per cent medium, 25 per cent inferior. See if your grading for accuracy alone ought not to be modified by giving the boys who finish during the first quarter of the time interval elapsing between fast man and slow man 25 per cent increase in their grades for accuracy as a bonus for "speed"; giving those who finish during the second and third quarters no increase or decrease; giving those who finish during the fourth quarter of the time interval a diminished credit of 25 per cent of their grades for accuracy. Collect data to see if your fast men are not only more accurate than your slow men but also retain longer that which is learned, both in the matter of technic and in execution. It is possible that a few notable exceptions may have been so marked as to cause a wrong generalization. Finer distinctions than this are hardly profitable as a "working proposition," tho it is recognized that students near the dividing line of the quarters are not quite fairly dealt with, the ones just above getting a little more than they deserve and the ones just below a little less. In all, remembering that the main business of the teacher is to teach, with grading a second and possibly minor consideration, it is safe to say that a teacher who recognizes individual differences will teach more wisely.

THE IMPORTANT DEPARTMENT IN A TRADE SCHOOL.

ARTHUR B. BABBITT.

THE department of drawing and design is one of the most fortunate divisions of all trade school work. Thru the subjects taught here it is possible to weave a close connection with every other section of the school, and to be instrumental in bringing the several departments into close relations with each other. The department may be a power, rise to its full opportunity, and become a useful and helpful factor in all school work, or it may be that part of the school where drawing is taught simply as a subject independent of anything and everything else in the school. Greater possibilities are before the department of drawing and design than before any one other section of the trade school. Every boy in the school comes into this department. Thus it touches the entire school. By its contact with all other departments and thru its influence upon every boy, an opportunity is presented which should make it one of the largest factors and one of the strongest influences in the development of the trade school product—the boy.

In drawing and design the student is taught to think in terms of three dimensions, to be able to conceive of an object from a combination of views in straight and curved lines, to judge correct proportions, to take into consideration the processes of manufacture, to figure the strength of materials, to devise schemes to reduce the cost of construction, and to invent mechanisms for accomplishing desired results. In other words, aside from being trained in the technic of mechanical drawing, to be clever with pencil and ink, the boy must acquire the ability to visualize an object from the drawing, and recognize the fact that in the object dimensions and proportions are not as they sometimes appear in the drawing. His training should also include a practical application of his shop practice and theoretical work thru the mathematical and constructional solution of design problems. There may also be the development of the inventive faculty thru the solution of constructive problems.

The graduate student in mechanical drawing must be able to think clearly in lines and views, must know drafting room conventions and symbols, and must be able to rapidly interpret complicated details. The ability to express himself to a foreman quickly and clearly in terms of sketches, and, if necessary, to make an accurate layout, are essential to the well trained trade student. While the work in the drafting depart-

ment should not be planned to turn out skilled draftsmen, courses designed especially to supplement and broaden the trade work will many times accomplish this result much better than those primarily laid out to train the student for the drawing room. Surely, during the first few years after graduation, while gathering experience, his ability to read, interpret, and make drawings will be of inestimable value. The best advice that can be given any trade student who aspires to the drafting room is that he work his way to that department thru the shop.

FUNCTION OF THE DRAFTING DEPARTMENT.

The function of the drafting department of any trade or industrial school should be not to make draftsmen but so to present the subject that no matter with what drawing the student may come in contact, he will be able to give his time, attention, and thought to the processes of manufacture required by the drawing and material furnished rather than to an interpretation of the drawing. Too many of our teachers are teaching the art of drawing rather than the science of drawing. The use of instruments, the making of a drawing that to the uninitiated looks "pretty," may be picked up by any bright boy with ease, but the making of a drawing that will stand the test of the machine-shop, the builder, or the plumber, is a work of science, and requires something more than technic. Many school drawings seem to have been made for pictorial effect rather than for practical use. Unless these drawings will stand the test of practical use in the shop or on the building, they are failures, no matter how beautifully rendered. The supreme test of any drawing is its use and not its appearance.

In order to make the drafting department of value to any school, at least three conditions must exist:

First. There must be a recognized department of drawing and design.

Second. The man in charge must know his subject from practical experience.

Third. The work must be so arranged that it touches the individual, at the same time reaches into and assists in a vital way all the departments of the school.

A RECOGNIZED DEPARTMENT.

Without an established department no man or corps of men can work with force, and no teacher can impress his pupils with the importance

and usefulness of the subject. Without a room somewhat resembling a shop drafting room and a good, serviceable equipment no man can do the type of work required by modern practice. Close association with the shop is an excellent feature, but when that association is so close that the work has to be done in one corner of the machine-shop, on top of the carpentry bench, or on the plumber's table, the atmosphere of drafting is so smothered that the boy is unable to discern it. In the machine-shop, the pattern-shop and the carpentry shop, the foundry, or the plumbing shop, the atmosphere of actual practical work should permeate the entire place, and the environment should be such that it will not be a shock to the boy when he reaches the genuine article outside.

This argument holds equally well when we speak of the drafting room, and compels an equipment and location of practical value. A drafting room located adjacent to every shop is ideal, but the design of our school buildings and the use of the same room for different classes of drawing usually prohibits this arrangement.

The second essential for a successful drawing department is that *there should be a man in charge who knows his subject from practical experience.* That phrase "a man who knows his subject" may seem somewhat startling, yet, there are teaching in some of our schools today men who may know somewhat of the theory of drawing, but who are not proficient in the practical application of the subject. Such men do not know their subject well enough to be teaching in trade school work. A good qualification for any teacher is that he be able to earn at least as much in drafting work as he does teaching the subject. If a trade teacher is not able to do this, his summers had better be devoted to becoming proficient in the trade, or his whole time should be given to the work until he becomes a master.

While I thoroly believe in theoretical training, I certainly feel that theory and practice are both essential to good work in trade teaching. How many draftsmen over the board ever think in terms of planes of projection or projections on planes? Who ever uses the ground line in practice? Who cares about the difference between first angle and third angle, when we simply have to remember that the machine draftsman usually places his top view over the front view and the architectural man almost invariably puts the plan below the elevation? As we teach each of these tradesmen his own particular practice, why bother with planes of projection? If we teach the student to visualize the object, to lay out something that is not a monstrosity when made in wood or

metal, and to put on the proper dimensions for the manufacture, we have accomplished a great deal more than tho we force him to take a thoro abstract training in complex relations of points, lines, and planes.

It is not simply necessary for the drawing teacher to know the relation of views, he must know as thoroly and as well the type and character of construction required by up-to-date approved practice. The teacher of machine drawing must be able to explain what type of fit is required in machine construction. He must know what allowances should be made for running, press, drive, and shrink fits, also where in the mechanism accuracy is required and where calipered or fractional dimensions will suffice. These are a few of the many questions to be answered by the machinist student as he solves his problem on the drawing-board. In other words, construction and dimensions are the vital essentials when making the drawing.

The architectural drafting teacher must be a construction man also. The orders of architecture are beautiful when nicely drawn, but used simply as copy work represent just so much labor to gain dexterity and skill. Combine with these orders a facade of granite, marble, or limestone making it a problem in laying out joints, placing of steel work, irons, and dowels, and you have an exercise not only in the drawing and application of the orders, but also a problem in masonry construction.

In plumbing, drawing problems should be presented which teach not only drawing, but the principles of drainage and ventilation as well. For instance, the location of three bath-room fixtures and the stack given in a plan view, with the elevation to be worked out by the student, will give a problem not only in drawing, but also one in the proper location of each fitting necessary to meet the requirements of modern plumbing regulations and to conform to the most scientific principles of drainage and ventilation.

These examples, I believe, indicate how men with practical training are required, in order to make a vital connection between drafting rooms and shops. Good, serviceable drawings made under such instructors may be used thruout the school with good educational effect. If we teach the boy the type of drawing he will see when he goes out into practice, have him use it in the school shop when he builds, and let him figure from it in his mathematical work, a respect for a systematic and orderly procedure will have been established in the student, a trait of character which has a value immeasurable.

CHARACTER DEVELOPMENT ESSENTIAL.

And we are not simply teaching trades,—we are establishing characters. A character should be formed which shows a willingness to cooperate with teachers, department, faculty, and officers of the school for the best interests of all; a character which has the spirit of unselfishness which makes a man anxious to do even the most disagreeable task with an energy and an effort worthy of the best job at the disposal of the instructor. A character of this kind is bound to result in regular and prompt attendance at all exercises, and attention to all matters and details of importance.

In the development of this character, the department of drawing and design should play an important part, as it touches every boy in the institution, and should touch each one in a personal and individual manner. This leads to the third essential necessary for a successful and correlating drafting department, which is, that *the work should be so arranged that it touches the individual needs of the student, and at the same time reaches into and assists in a vital way other departments of the school work.* This is the most important of the three essentials named, and is usually the most difficult of accomplishment. The first two—the establishment of a department, and securing the proper type of teacher—are matters in the hands of the executive of the school, while the third essential is dependent almost entirely upon the tact, resourcefulness, energy, and initiative of the department head.

To reach into and assist all departments of school activity requires associations with every departmental teacher in the faculty. This association should be so close that one may determine accurately the desires each man has for the advancement of the pupils in his department. It should be so intimate that one may supplement, assist, or lead in the work as the circumstances seem to demand. There are times when the drawing department should lead; under other circumstances it must supplement, assist, or follow. While drawings should be made for all departments, it is not necessary that all suggestions originate in the drafting room. Many of them should. Most, however, should come from the shops. The men in charge here know what they need, and the drawing department should supply that need. Not that the shops should dominate the design or the manner of drawing, but the final result should be a design and drawing satisfactory by mutual consent. That mutual consent should include the boy who makes the drawing, for he will, many times, bring into the problem valuable ideas and suggestions.

A FEW EXAMPLES.

Let us assume that the machine-shop wants a special tool holder for the boring mill, or a jig for a certain operation. The drawing department should be ready to supply the design for the machine-shop instructor's approval, and the drawing for the manufacture of the required device. The need is expressed by the machine-shop, the design is supplied by the drawing room, to be altered to suit the requirements of the machine man. The drawings are then made from which to build.

Another example may be taken from the mathematical department. The teacher of carpentry and building estimating feels free to come and say, "I want some plans of simple structures from which my class may draw off bills of material and make estimates." The drawing department suggests a band-stand, pergola, tool-shed, etc. Before the conference is over, a dozen or more subjects, some simple and others complicated, are suggested. It is now the duty of the drafting teacher to select his men. There must be men somewhere in his classes who will be benefited by these different problems. Men who will profit by these examples are selected and the layouts are made, the estimating instructor coming in to suggest changes and approve results as occasion may require. Here is an opportunity for the drafting instructor to choose the problem of most benefit to the boy, and at the same time to advance the work of the school by helping the estimating department.

If all the problems needed by other departments cannot be finished immediately, the result should be received by the instructors with the same spirit of cooperation as the drawing department attacks the problems. Such is the spirit of cooperation that must exist if the drawing department is to reach into and assist all other departments. In the last analysis, a close association of departments is the solution of the successful school; and, touching each of the others as it does, the drafting department has a special opportunity.

THERE IS NO BETTER WORK THAN PUTTING THE BOTTOM OF THE LADDER WHERE THE MAN IS, SO THAT HE CAN, BY HIS OWN EFFORT, CLIMB TO THE TOP. —Samuel Chapman Armstrong.

SOME SUGGESTIONS FOR ECONOMY AND EFFICIENCY IN MANUAL TRAINING MACHINE-SHOP EQUIPMENT.

M. W. Murray and F. P. Dunbrack.

PROBABLY most manual training instructors will agree that two of the important functions of a machine-shop course in a manual training school are: (1) to develop skill of hand and eye, and (2) to give some appreciation of the machine-shop side of the manufacturing industry by the use of machine tools to form metal.

Machine-shop courses in manual training have undoubtedly been severely handicapped in their development by the lack of a sufficient number of machine tools for demonstrating the different fundamental machine operations. On the other hand, in many manual training and technical high schools there has been spent an unduly large amount of public money for expensive machine-shop equipments which could not be justified on the basis of the amount of time used or of the knowledge gained by any student or group of students.

Assuming that conditions in a community are such that the question of expense does not have to be considered, we may well ask ourselves the question, "Can we not teach the same principles in a shorter time, or, in other words, teach more machine-shop practice in the time now given to the work, with much less expensive equipment than has heretofore been considered necessary?"

Manual training, on the whole, is hampered for lack of equipment; on the other hand, where large expenditures have been made for machine-shop equipment, they are not justified by results. In these days, when so much attention is given to the development of vocational courses, such expenditures are a hindrance to the development of such courses, because of the financial inability of most communities to duplicate equipments.

Probably ninety-five machinists out of a hundred would consider it absolutely necessary to have one of the expensive equipments mentioned above, if they were to instruct boys in the principles of machine work. This is due to a lack of knowledge on the part of most excellent machinists, of what can be accomplished with the bench lathe and its equipment, and the bench milling machine. These tools were first developed in the industrial centers which do the smallest and finest grades of machine work called for in connection with watch and clock making, typewriter and sewing-machine building, jewelry manufacturing, and in exceedingly fine tool building. They should not be regarded, however, as

having little or no use outside of this class of work. These tools are steadily growing in favor, and few first-class tool rooms are now without at least one bench lathe. They have demonstrated their ability to turn out small work more accurately and at less expense than the larger tools, and it is safe to predict that they will steadily grow in favor until they are universally used in connection with all plants where a comparatively small number of pieces of one kind is made. The bench lathe costs less than one-fourth of the price of a good engine lathe, takes up less room, and with its various attachments, not more than one of which would be required for a dozen or fifteen lathes, it is capable of producing work more accurately and in less time, and of doing a wider variety of work than it is possible to accomplish on the larger machines. The plain bench miller can be bought for approximately two hundred dollars ($200.00), or about one-half the cost of a universal milling machine, say, four hundred and seventy-five dollars ($475.00). As a matter of fact, the smaller tools are better adapted to turning out the work that is now produced in the average manual training school than are the larger.

The bench lathe is regarded by many, and even by good machinists who have never had experience in shops where it is an absolute necessity, as a sort of toy—a speed lathe for centering and polishing. The watch and clock industries are responsible for the development of the bench lathe and are the largest users of the machine; but bench lathes are gradually finding their way into the regular machine-shops, until today no up-to-date tool room is complete without one or more precision lathes equipped with all attachments. This is especially true in shops which manufacture machines or equipment with many small parts, such as typewriters, sewing machines, adding machines, scientific instruments, jewelry, various kinds of meters, fire alarm and recording systems, time locks, etc. The bench lathe is used in making tools, dies, and jigs, in experimental work, and in cases in which many small parts are to be made, but not a sufficient number to warrant the cost of making special tools or dies. The reason that the bench lathe has not been given wider use is that machinists in general do not appreciate its worth, or know of its adaptability to various kinds of work. It is necessary for a machinist, in order that he may know fully the worth of the bench lathe, to work in a shop on a class of work where the bench lathe is a necessity.

In manual training courses, the bench lathe has the following points of merit:

1. On account of its speeds and feeds it is adaptable to very simple

as well as to very complex work.

2. There is less danger to the boy as well as to the machine.

3. The principles of machine work, grinding of tools, accurate measurements, and various operations of lathe work, milling and grinding, can be taught as well as on larger machines.

4. The cost of equipment, tools, and materials is lower.

5. A larger number of jobs can be completed in a given length of time than with the larger machines.

6. On account of the hand feed, the boy's attention is more closely held. The lathe will not work unless the boy works it.

The bench or precision lathe, as it is usually called, was first developed and manufactured by John Stark, who established in Waltham, Massachusetts, in 1862, a machine-shop for building small machines and tools for the watch industry. The first one was a very small jewelers' lathe, but the size was gradually increased until at present the largest size will hold $1\frac{1}{4}''$ diameter stock in the collet. Probably the size best adapted for general purposes is the No. 4, which swings 9", and has a collet capacity for stock from 1/64" to $\frac{3}{4}''$ clear thru the spindle.

By reason of the light driving belt, hardened, ground, and lapped spindle, and bearings in the headstock, the lathe can be run at a high speed with but very little side or end play, thus assuring very accurate work. Various speeds, usually six, can be arranged to cover a wide range, usually from about one hundred and sixty R. P. M. to about two thousand, and where desired, reverse speeds can be added when the screw cutting and turret attachments are used.[1]

In machine-shop practice, any machine that can be readily adapted to hold work in a number of different ways, or which can easily and quickly be made to perform a large number of operations, is a desirable machine. By using the grinding, threading, and milling attachments, all the machine operations which can be performed on the ordinary engine lathe can be done on the bench lathe, and in addition a large number of milling and grinding operations, such as the milling of small taps, reamers, end mills, angular milling cutters, and slotting of screws, grinding small mandrels, reamers, lathe centers, end mills, tapers and angles (both internal and external), can be performed. The ease and speed with which the various attachments can be set and adjusted is also a very favorable factor, when the students time is considered.

Students may be started on work of a very simple nature, for example,

[1] The speeds of lathes at the Newton School are 1960, 1280, 870, 350, 230, 155.

holding a piece of cold rolled steel in collet and turning, threading, and cutting off a machine screw. From this elementary start the student may progress to the more complex and difficult work, for example, the turning, milling, and grinding of a double angle milling cutter. In using these machines the principles of machine work, the grinding of tools, accurate measurements, setting and adjusting of tools, can be taught as well as on the larger machines; in fact, these principles can be more readily taught on the bench lathe because of the size of the work, the larger number of jobs which can be completed, the ease and speed of adjustment of machine to the work, and the interest the student generally has in seeing a job completed, and in starting a new one.

There is also less danger to students, as well as to the machines. A serious accident is hardly possible either to student or machine. Because of the foot shipper and hand feed the attention of the student is held very closely. To run the lathe, the foot must be kept on the shipper treadle, the hand on the feed handle, and the eye on the work. This keeps the operator busy all of the time. He cannot, as on the larger machine, put on the power, throw in the feed, and go away and let the machine run.

The cost of material is also an important factor in machine work.

SUGGESTED EQUIPMENT FOR MACHINE-SHOP FOR TWENTY STUDENTS.

15	No. 4 Bench Lathes, (Stark)	$1,125.00
15	No. 4 Bench Lathe Slide Rests (Stark)	562.50
1	No. 4 Bench Turret Head (Stark)	67.50
1	No. 4. Bench Cutting-Off Rest (Stark)	30.00
1	No. 4 Bench Threading Attachment (Stark)	63.75
1	Plain Bench Milling-Machine (Stark)	187.50
4	Slide-Rest Traverse Grinders	60.00
1	14″ Engine Lathe Comp. Rest and Taper Attachment (Reed)	475.00
1	20″ Metal Planer (W. & B.)	650.00
1	No. 1 Universal Milling-Machine (B. & S.)	750.00
1	Universal Cutter-Grinder (Norton)	400.00
1	Drill-Press	150.00
1	Power Hack-Saw	100.00
1	Hardening Furnace	200.00
20	Bench Vises (No. 19 Prentice)	120.00
1	Arbor Press	15.00
	Bench Lathe Counters	168.00
1	Wet Grinder (Townsend)	70.00
	Small Tools and Equipment	about 1,000.00
	Motors, Shafting, Hangers, Belts, Pulleys, Benches, etc.	800.00
		$6,994.25

The selection and installation of an equipment of the above description should be in charge of the instructor who is to do the teaching. In order to obtain the best results he should be a practical man, who has had considerable experience on bench lathe work, in addition to general machine-shop practice.



MADE BY STUDENT AT TECHNICAL HIGH SCHOOL, CLEVELAND, OHIO.

CANE WEAVING.

L. Day Perry.

ANY medium which adds life to problems in manual training and which arouses interest and enthusiasm in the work at hand, is generally justifiable. Such a medium, among others, is cane weaving. That it has not been undertaken to any great extent in school shops is due to the fact that instructors are not familiar with the weaving processes. Caning is not difficult. It, in common with many other lines of activity, is best learned thru observation. However, it may be undertaken by the average person after careful study of printed directions and illustrations. If the worker will closely observe his own work as it progresses and follows instructions carefully, he should have no unusual difficulty in caning an area very acceptably at the first attempt. Particular attention should be paid to directions which tell of errors to avoid. Errors creep in in a very unobtrusive manner at times, and the amateur will find them hard to detect.

CANE.

Cane is the name applied to a great number of plants which possess long, slender, reed-like stems. The name should apply only to a class of palms called rattans. These plants are found thruout the Indian Archipelago, China, India, Ceylon, and the Malay Peninsula. They grow in dense, dark forests and form dense undergrowth which makes passage difficult or impossible. These palms are trailing in tendency, yet frequently grow to tree height. They then fall over and lie on the ground. The stem is covered with beautiful green foliage, grows to a length of 100 ft. to 300 ft., and rarely exceeds 1 in. in diameter. The stems are cut into lengths of 10 ft. to 20 ft. for export. The outer bark is stripped into widths varying from $\frac{1}{16}$ in. to $\frac{3}{16}$ in. These strips are put into hanks of 1,000 lineal feet each. The cane is then ready for the cane weaver. A hank of cane costs from 60 cents to $1. The width of the cane and its quality determines the price per hank. It may be purchased from any upholstery supply house.

Cane is named from the narrowest to the widest in order—carriage, super-fine, fine fine, fine, medium, common, narrow binder, and wide binder. Cane from India has a very glossy surface, while that from

other localities is duller. The right side of the cane is easily determined by this glossiness.

Cane, for weaving purposes, should not be confused with the popularly called cane or bamboo of our Southern states, where it forms the well known cane-brakes. This cane rarely exceeds a height of 20 ft. It grows rapidly and very straight, and to an appreciable diameter. Such cane is used for bamboo furniture, walking sticks, poles, etc. The ordinary domestic sugar cane, also, should not be confused with seating cane.

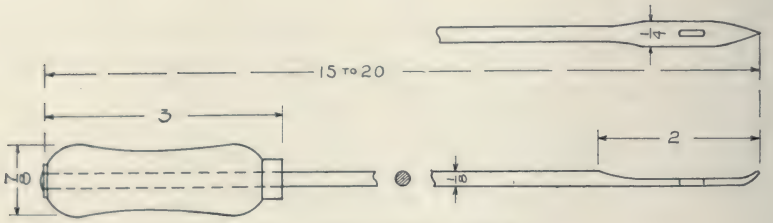


FIG. 1. THE CANING NEEDLE.

EQUIPMENT.

The tools needed in cane weaving are few in number. A special one is called the caning needle. This may be made in the school shop. Fig. 1 shows a working drawing of the needle. Its length is variable, depending upon the work at hand. It is desirable to have a number of different lengths. The tool is made of good round steel wire. This is flattened at one end, an eye cut in it, blunt pointed, and slightly curved, as indicated. The other end is inserted in an ordinary small tool handle, is extended thru and riveted. The riveting prevents the wire from drawing out of the handle under a pulling strain.

The other tools needed are a scratch awl, and a pair of scissors or knife. A button-hook, with the hook straightened or cut off, may take the place of the awl. A pair of dividers and rule are necessary for marking. Several wood pegs are needed. These may be classed with the tools. They are made from a ¼″ dowel rod, or the equivalent. Cut them about 4″ long and point them as you would a lead pencil. The amateur is inclined to use a number of pegs. Four should prove amply sufficient.

BEGINNING THE OPERATION.

Fig. 2 is a photograph of an upholstered leg rest with caned sides. This rest will be used for our initial work in cane weaving, inasmuch as the area for caning is rectangular. It is not advisable for the beginner to have his initial experience on a chair seat, for the area is usually of an odd shape, and arms, legs, and back interfere. However, any rectangular area on which there are no projections to bother, may be used for the first trial.



FIG. 2. LEG REST.

It is assumed that the entire sides of the rest have been fitted. The rails and stiles are then assembled with glue, without the posts. When the glue has set the proper length of time, and the frame is cleaned and sanded, the rails and stiles are ready to dimension.

Draw pencil lines entirely around the inner sides of the rails and stiles, ½″ from the edges. This distance remains constant, usually, on all areas and with various width canes.

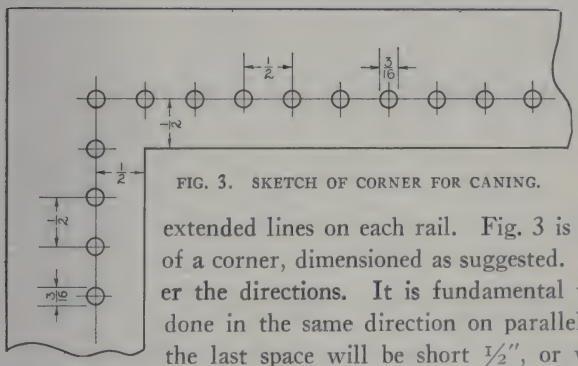


FIG. 3. SKETCH OF CORNER FOR CANING.

With a pair of dividers, set at ½″, space off points on the pencil lines, starting from the intersection of the extended lines on each rail. Fig. 3 is a working drawing of a corner, dimensioned as suggested. It will make clearer the directions. It is fundamental that the spacing be done in the same direction on parallel rails, for at times the last space will be short ½″, or whatever dimension is used. In such cases it is necessary to re-divide the last several spaces into divisions as near the ½″ as possible. It thus becomes obvious why spacing must be done in one direction as stated. This applies to all rectangular frame.

Now with a 3/16″ wood bit bore holes thru the rails and stiles at the points marked. Countersink the holes slightly on the underside of the

frame. This is not absolutely necessary, but aids considerably in locating the holes and in other ways. The dimensions given here are for fine fine cane. Use sandpaper to remove pencil lines and rough edges left from

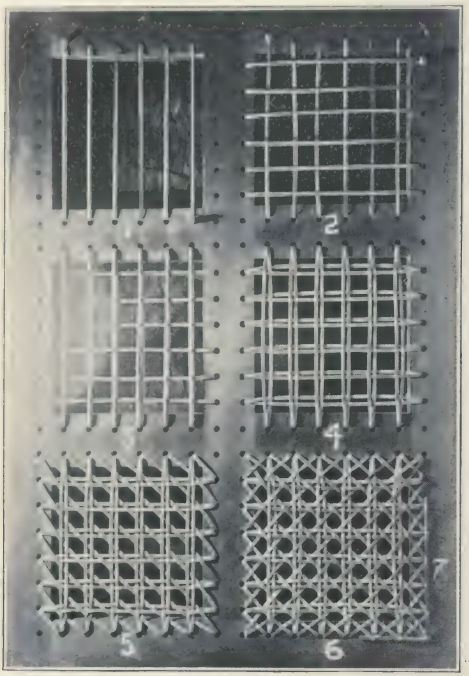


FIG. 4. THE SEVEN STEPS IN CANING.

boring, then clamp the frame over the edge of a table or bench with a carriage clamp, and work while sitting.

THE SEVEN STEPS IN CANING.

Fig. 4 shows the seven steps in caning. Refer to this photograph thruout the following directions. The numbers on the photograph refer to the steps.

Step 1. A hank of cane should be soaked for a few minutes in warm water, or longer in cold. Do not soak it too long. Start a strand by drawing one end thru a hole next to a corner one, and let it project about three inches below. Fasten with a peg. Then starting at the

peg, pull the entire strand thru the thumb and forefinger to prevent twisting, and pull the end down the hole on the opposite parallel rail next to the corner hole, and then up the hole next to it. See that the right side of the cane is out on the underside of the frame, as on the top. Pull the cane reasonably taut, and fasten with a peg to prevent the strand from slipping back and becoming loose. Draw the cane thru the thumb and forefinger again, pull it across the frame and down the hole next to the peg and up the hole next to it. Pull taut and fasten with the second peg. This operation is repeated until all holes have been utilized on the two parallel rails, excepting the corner ones. Thruout the seven operations, it is necessary that the cane be kept from twisting by drawing the remaining strand length thru thumb and forefinger



FIG. 5. METHOD OF TYING ENDS OF CANE.

Step 2. The second step is identical with the first, with the difference that the other two parallel rails are used, and that the canes run *over* the first set of parallel canes. If the first strand of cane has not been entirely used up in the first step it is to be used to begin the second step.

Step 3. This step is a repetition of the first two. The canes of this series run *over* the first and second series and parallel with the first. As each strand is used up bind the end by pulling it under a cane, crossing from one hole to another underneath the frame, and cut off about ¼″ from the cane. Fig. 5 shows how this binding is done. The loose end at the start is tied in this way, and all subsequent ones should be tied as they come, thus avoiding interference of many pegs and insuring neat binding.

Step 4. The actual weaving begins with this step. It may be done entirely by hand, without resort to the needle, but it is slow work. The needle should be used. Start at a hole next to a corner on either rail that has been used but *once,* and on the side of the cane toward the open frame. Go over and under the strands necessary to form the weave, turning the needle from side to side in order to catch the canes behind the point. When across, thread the needle with the strand and pull thru, being careful to avoid a twist. Pull the end down thru the hole, pairing

the canes. Pull the cane up thru the next hole, then start the needle from the opposite side of the frame and repeat the first operation, thus pairing another set of canes. Continue until all canes are paired, and holes used, when the weaving is completed. Soak the woven cane with a wet sponge and with two pegs straighten the strands of cane and force all pairs together. Small, open squares are thus formed over the area being caned. Unless the cane is soaked it will prove rather difficult to pair the canes.

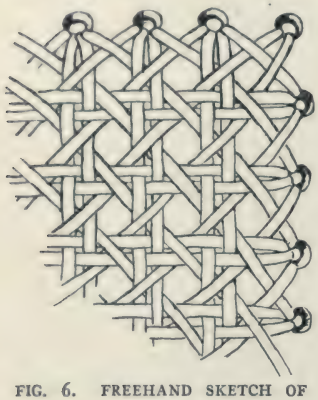


FIG. 6. FREEHAND SKETCH OF CANING.

Step 5. This step is the weaving of one set of diagonals. Start the strand at any corner hole. Use one hand over and one under the frame. Use an end of cane long enough for convenient handling; then pull the entire strand thru the length of the frame, provided the area is not too great. Care must be taken to avoid twisting the cane. The cane will run easily and partially under a cane at the corners of the squares if correctly done. Fig. 6 shows this clearly. The corners will bind, and the strand pull with difficulty if incorrectly woven. On parallel canes notice that the diagonals either run *over* or *under*.

Step 6. This step is identical with the preceding one. The canes are at right angles to the first diagonals. In this step and the last one notice that two canes run into the corner holes. This holds true in all rectangular frames. It permits the strands to run in as straight a line as possible. If it is necessary to turn abruptly to enter a hole it is obvious that an error has been made in this particular.

Step 7. Pull a cane of the same size as used in the other steps up thru a hole, over the binder cane and down thru the same hole. A loop is thus formed and the binder secured. Pull taut, then enter the next hole, pull up the cane, over the binder, and down, and so on. This operation may be repeated at every other hole when the holes are close together. The two ends of the binder are finally overlapped and secured, and the operation thus completed.

SUGGESTIONS.

As weaving progresses difficulty will be experienced in inserting cane ends in the holes, due to their becoming filled. Force the scratch awl down thru and turn it several times. This will effectively force an opening.

In many instances ends of cane are left from one series to another. These generally, as previously mentioned, should be used in succeeding steps. There is one limitation, however. They should be used provided it is not necessary to carry them over more than four holes on the under side of the frame. The fewer loose ends left, the better, for the caning is thereby neater and better. It is advisable generally to use a full length strand, to avoid a number of loose ends.

The amateur will find his greatest difficulty in properly weaving the diagonals at the edges; that is, immediately upon entering or leaving a hole. Many commendable pieces of caning are spoiled by ragged, improperly woven edges. Care must be taken to see that the cane goes *over* or *under* the proper strand or strands at these points. Fig. 6 clearly shows how the diagonals should run. Study it carefully.

The addition of a binder is generally a matter of taste. Perhaps fifty per cent of modern hand caned furniture does not employ a binder of any description. The series of regularly exposed holes are rather pleasing and in no way detract. However, in chair seats a binder is essential to protect the ends of canes, for they are subject to hard wear.

A binder of reed, or of wood, called "splints," may be used on hand caned frames. If either is used a groove 1/4" deep and 3/16" wide is run coincident with the holes before weaving is begun. After the area is caned the strips are fitted and glued in. Use little glue. Tap the splints firmly with a mallet used over a block of wood until they are flush with the woven cane.

The size of the holes and the distance between them is determined largely by the size of the cane used. Some prefer coarse meshed areas, while others desire them closely woven. There is, however, what we may term a standard mesh. The individual may vary the dimensions given to suit himself.

Carriage and superfine cane require 1/8" holes and 3/8" spaces; fine fine cane requires 3/16" holes and 1/2" spaces; fine cane requires 3/16" holes and 5/8" spaces; medium, 1/4" holes and 3/4" spaces. Fine fine and fine cane are the best sizes for shop use. A small amount of medium binder is desirable.

One hank of cane will ordinarily be sufficient for a half dozen areas of approximate dimensions of twelve inches square.

Most old pieces of period furniture utilizing cane, employ a particularly narrow split horizontally and vertically, with a wider split used diagonally. The opposite practice may be employed—a finer split of cane used diagonally than that used horizontally and vertically. Both effects are pleasing.



FIG. 7. WINGBACK CHAIR.

It is frequently necessary or desirable to cover up the cane on the back or inside of an article. This is true of places exposed to view and is especially advisable on such pieces of furniture as the wingback chair shown in Fig. 7. This chair of William and Mary design was made in a school shop, is hand caned, and of mahogany. The exposed cane is covered with strips of mahogany ¼″ thick and 1″ wide in which a groove ⅛″ deep and ⅜″ wide has been run. This groove may be made with saw, chisel, or combination plane. Fig. 8 shows a sketch of such a strip. It makes a neat, pleasing cover. Many pieces of so-called expensive furniture have ragged, exposed caning. This is unsightly and is not to be commended. Wherever it is desirable to leave cane natural, it is necessary that the frame be stained before caning is begun. Box fuming will not permanently color cane. Oil stains maks no appreciable impression if rubbed off at once. But water, acid, and alcohol stains produce decided colors. If the worker desires to color the cane approximately the same shade as the article, the caning may be done on the white wood, and the entire article stained at the one operation. Cane may be shellacked or varnished or left natural, as desired.

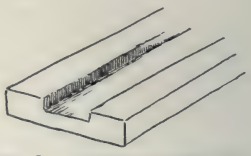


FIG. 8. SKETCH OF STRIP TO COVER CANE ENDS.

IRREGULAR AREAS.

Fig. 9 shows a close view of the back of the chair illustrated in Fig.

7. This is a typical example of an irregular shaped area for caning. The principles of weaving remain the same in areas of any shape, yet each requires slightly different treatment. Each has its individual problem. It is necessary to skip some holes altogether. This is never done in rectangular shapes. A close inspection of the photograph will



FIG. 9. BACK OF CHAIR SHOWING ODDLY SHAPED AREAS.

reveal many skipped holes. This is necessary to keep parallel strands equivalent, and diagonals straight.

To clearly understand how the holes are located on a wing of this chair refer to Fig. 10. The left stile and lower cross rail are at right angles to each other. The upper rail is curved and the right stile slanted. Measurements are begun at the lower left hand corner and proper distances spaced on the left vertical stile. With the arm of a try-square

against this stile points are marked on the slant stile in line with those on the former. This operation is repeated on the cross rail and curved one. Strands of cane will then obviously run parallel. Inasmuch as there are five holes in the base and eight in the top it is necessary that

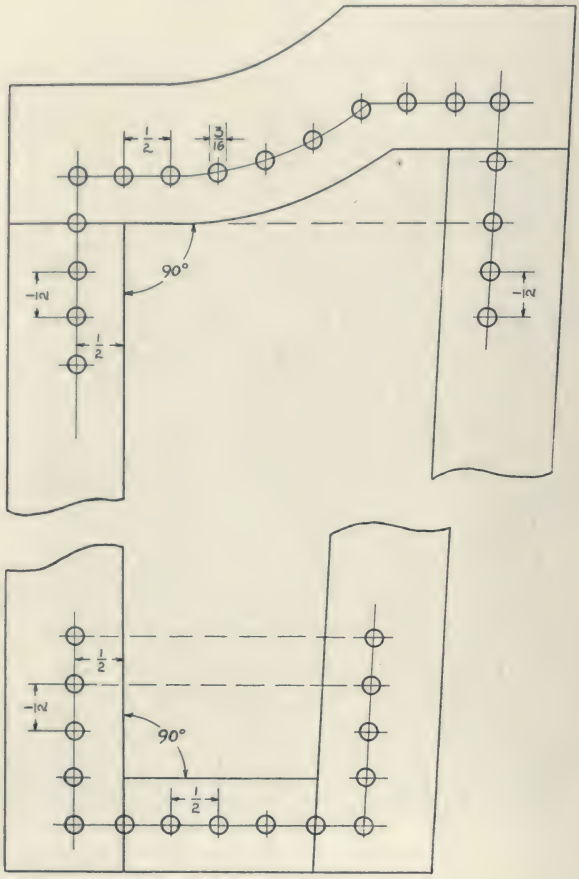


FIG. 10. METHOD OF LOCATING HOLES ON WING OF CHAIR.

three vertical strands be run into the slant stile in any holes which will permit the strands to run parallel to each other. The photograph of the caned wing, shown in Fig. 11, should make very clear the foregoing explanation. Experience with several unusual shapes is necessary before the weaver feels confident of readily caning any area of odd shape.

In weaving the diagonals it is frequently necessary to run several in one hole in order to keep the canes as straight as possible. Just when this should be done can only be determined by the weaver. A diagonal should never be permitted to swing to any great degree out of a straight

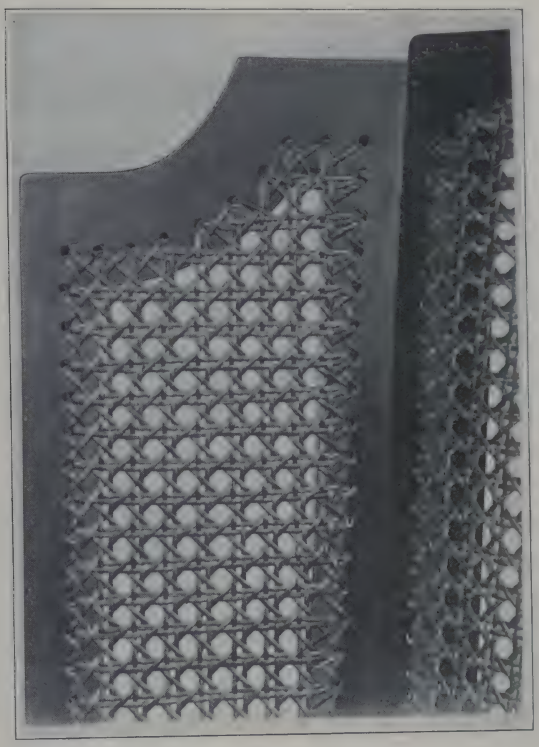


FIG. 11. CLOSE VIEW OF WING.

line. A close observation of the photograph of the wing will reveal many diagonal canes in one hole, and several holes entirely skipped.

FIVE STEP CANING.

Cane weaving of five steps is not common. It may be done in many cases where it will not be subject to hard wear. It is neat in appearance and is much simpler than seven step caning. The presumption should

not be made that this weave will in any way supplant the regular weave, but in instances where decoration is the objective, and not particular service, this weave will prove efficient and effective.

Fig. 12 illustrates a frame caned with the fewer steps. The distance between holes was purposely made greater than usual, to show the weave clearly. The first strands are strung in in the same manner as described

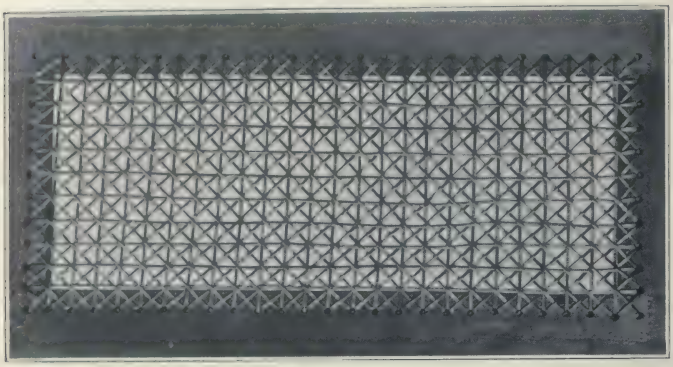


FIG. 12. FIVE STEP CANING.

in the seven steps. The second series of strands are interwoven with the first. The over and under weave is used. Each alternate row of each series is either over or under. The first diagonal strands run *over* the preceding two series. They are not woven as in seven step caning. The second diagonal strands run *over* the first diagonals and *under* the intersection of the other strands, including every alternate first diagonal. This resolves itself into simple over and under weaving. Note that but one strand of a diagonal enters a corner hole. This is not true of seven step caning, as elsewhere indicated.

THE DESIGN ELEMENT.

Caning is not a fad. Its functional use began in England in the period known as Jacobean. It was used in many succeeding periods both to fulfil a need, and for purely decorative purposes. Its introduction at first was undoubtedly brought about by a desire for something light, substantial, and serviceable, and it blended well with the oak of the period. Cane is much used on modern furniture, and without doubt

it adds to the beauty of a piece of furniture. In many cases the decoration is over-done, and instead of improving the article, the cane in reality detracts. Properly used it enriches by breaking up flat uninteresting areas, and lightening the appearance of otherwise massive, cumbersome articles.

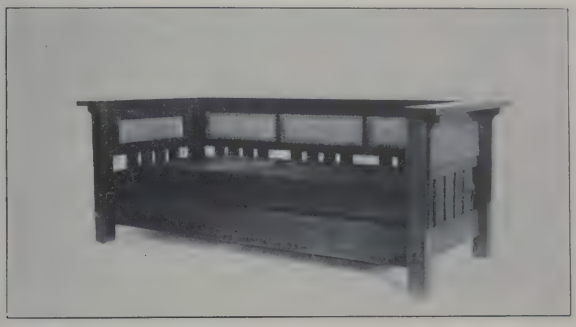


FIG. 13. DAVENPORT WITH CANED PANELS.



FIG. 14. BOOK SHELVES WITH CANED PANELS.



FIG. 15. TABLE. SIDES CANED.

Under proper correlation with wood in school shops it promotes an appreciation of constructive design in which the element of beauty is a prime consideration. It is a practical medium in which the aspect of design as an element of utility is another consideration. It has distinct commercial value, for the boys who have had training in the shops may

do chair seating outside and earn considerable money. By such work they come to see a distinct relation between the commercial field and their shop experiences. This is a point of view which is very desirable in present-day industrial education.

Cane, under ordinary conditions, will last years. It is doubtful if it will outwear well built chairs, or other pieces of furniture, but neither will upholstery. This therefore cannot be held as a point against its use.

Figs. 13, 14, 15 and 16 show pieces of furniture made in manual training shops by eighth grade boys. These pieces comprise a group, with the addition of the leg rest shown in Fig. 2, for a library or living room. The cane is each instance adds materially to the artistic effect of the problems; they have tone. The cane forms pleasing groups well related to the wood mass. The cane is natural, the wood fumed, and therefore the two tones of color are in perfect harmony.

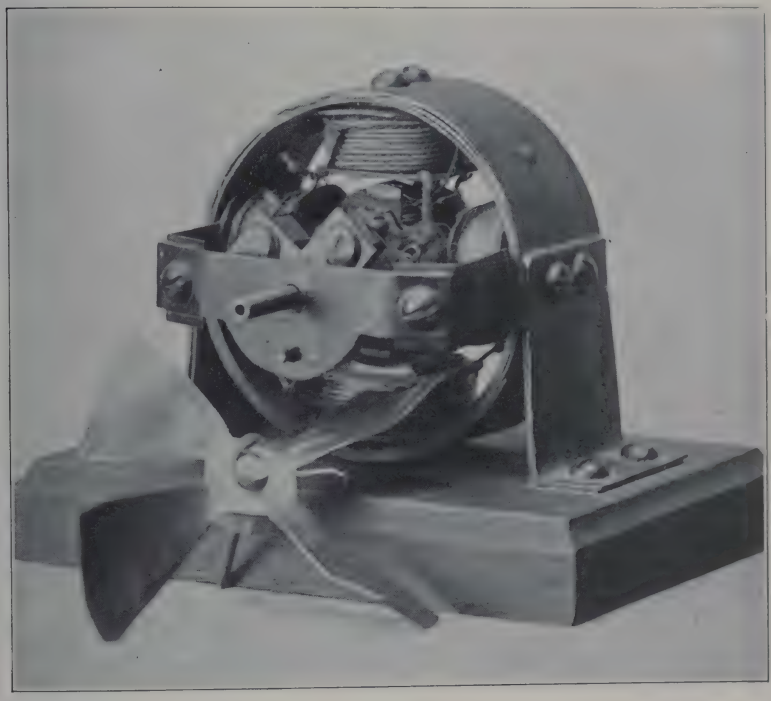


FIG. 16. ROCKER WITH CANED SIDES.

A FOUR-POLE ELECTRIC MOTOR.

A. A. Weinstein.

THE construction of the four-pole electric motor described herein is suggested as a third-year shopwork problem for the ordinary high school, to be correlated as closely as possible with the work in physics. It is expected to occupy three or four laboratory periods per week for a year. The current required for the motor is a six-volt circuit carrying four amperes.



A FOUR-POLE ELECTRIC MOTOR. SUGGESTED AS PROBLEM IN THIRD YEAR HIGH SCHOOL SHOPWORK.

The list of materials required, and the outline of the successive steps in the process of construction, will be sufficient to enable the student to carry the project thru, with suggestions from the instructor as needed. The letters in Italics refer to the details shown in Fig. 1.

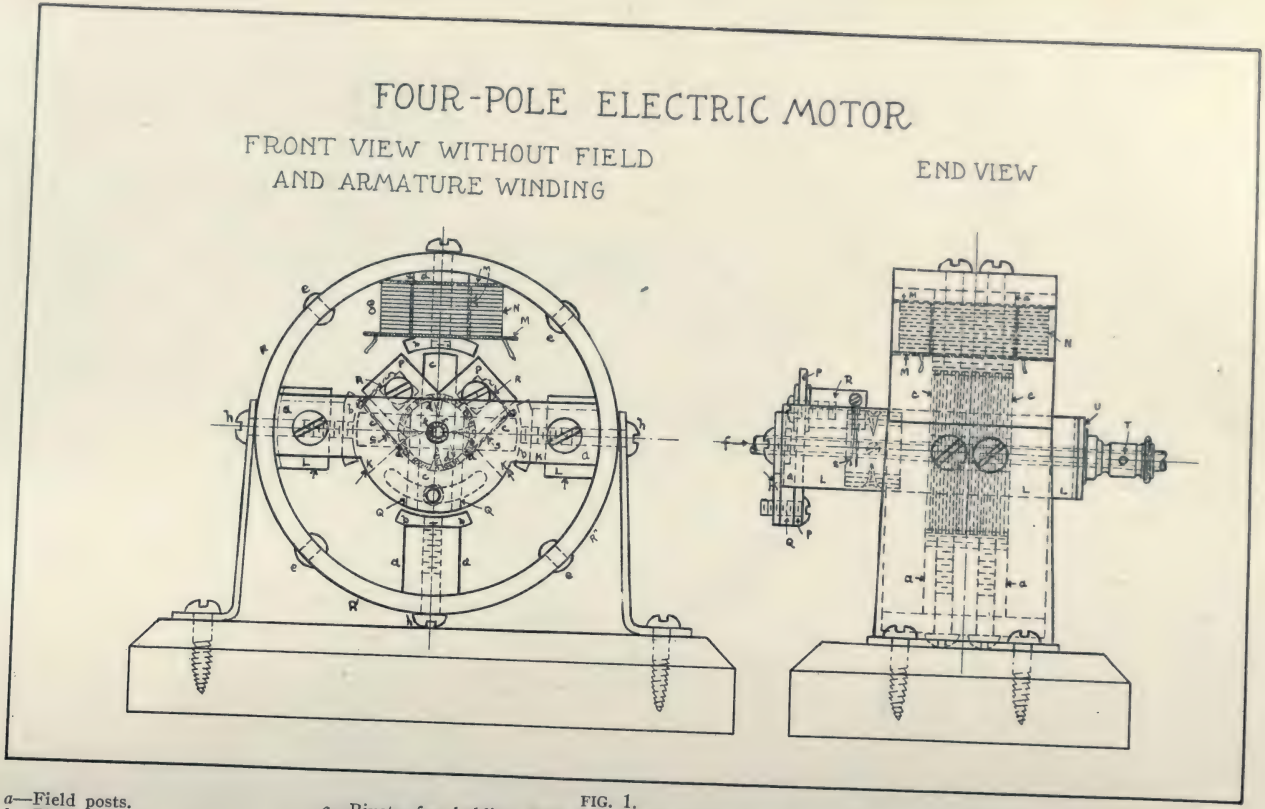


FIG. 1.

a—Field posts.
b—Field shoes.
c—24 pieces put together to make armature core.
d—Four brass segments of commutator.
e—Rivets for holding field rim *RR'R''*.
f—Brass tubing for shaft.
g—One field coil.
h—Round head screws.
k—Armature end support.
l—Armature side support.
m—Sheet fibre for insulation.
n—Wire of coil *g*.
p—Rocker arm.
q—Piece for blocking out.
r—Pieces for holding brushes.
s—Armature brushes.
t—Two binding posts.
u—Other armature end support and also to hold binding posts *t*.

MATERIAL FOR THE FIELD.

Rim: *RR'R''* One piece No. 20 gage sheet iron 1½'' wide x 30'' long gives a rim of 3'' inside diameter x $\frac{3}{16}$'' thick.

Posts: *a*. 2 pieces ½''x¾''x20/32'' Bessemer soft bar steel.
2 pieces ½''x¾''x19/32'' Bessemer soft bar steel.

Shoes: *b*. 4 pieces ⅛''x¾''¾'' Bessemer soft bar steel. Iron screws, *h*, 1'', round-head, No. 10, 32 threads to the inch.

No. 21 B. & S. gage double cotton covered (d. c. c.) wire, *N*, 92 ft. (23 ft. for each of 4 poles).

1 spool medium weight linen thread.

5 round-head rivets, *e*, ⅛'' diam. x ¼''.

1 coil No. 20 B. & S. gage soft iron wire, for binding rim.

8 pieces sheet fiber, *M*, 1/32''x1¼''x1½'' (2 for each pole), for ends of field coils.

4 pieces sheet fiber, *M*, 1/64''x$\frac{7}{16}$''x7½'', for lining of field coils.

MATERIAL FOR THE ARMATURE.

2 pieces No. 20 gage double Bessemer soft steel, ⅝''x3'', for end supports, *U*.

2 pieces No. 20 gage Bessemer soft steel, ¾''x3⅝'', for side supports, *L*.

50 pieces, *c*, No. 20 gage strap iron, $\frac{5}{16}$'' or ⅜''x1½''; 24 of which give an armature core of ¾'' thickness.

1 piece brass tubing, *f*, or steel shafting, $\frac{3}{16}$''x4''.

4 pieces No. 22 B. & S. gage d. c. c. wire, 4' long, for winding armature.

Shellac, parafin, medium weight linen thread, mica.

1 piece dowel-rod, $\frac{3}{16}$''x4''.

1 piece round fiber rod, ⅝'' diam.

1 piece brass tubing, *d*, ⅝'' inside diam. x ½''.

8 wood screws, No. 1, ¼'', flat-head, brass.

1 piece band iron, $\frac{1}{16}$''x1¾'', for rocker arm, *P*.

1 piece band iron, *Q*, ⅛''x1¼'', for blocking out.

1 machine screw, No. 6, ⅜''x32''.

2 pieces soft iron, for brush holder, *R*, ¼''x¼''x½'', with unit for locking rocker arm.

2 pieces tubing, ¼'' outside diam., $\frac{3}{16}$'' inside diam., x ½'', to be soldered to soft iron.

EQUIPMENT REQUIRED.

1 bench or work table.

1 metal vise.

1 drill.

1 metal vise, for use on bed of drill.

1 set twist drills.

1 card table of sizes of twist drills.

1 bench shears, for cutting metal strips.

1 wire winder for making coils.

Jigs; forms; punch; snips; scribers; dividers; micrometers; hack-saw; files, flat and round, medium and coarse; try-square; soldering materials; brush for cleaning files; metal rules; oil-can.

METHOD OF CONSTRUCTION.

1. Winding soft iron band, 30″ long, on form 3″ in diameter, to make the field rim, *RR'R″*.

2. Binding, with soft iron wire, to hold rim in shape.

3. Laying out centers on rim, and drilling holes for rivets and screws, to hold pole and field shoe together, *e* and *h*.

4. Sawing and filing to dimensions: 2 field posts, *a*, ½″x¾″x20/32″; 2 field posts, *a*, ½″x¾″x19/32″; 4 field shoes, *b*, ⅛″x¾″x¾″.

5. Laying out and drilling holes in field posts and field shoes, to receive screws, *h*, from outside of field rim.

6. Cutting threads in holes in field shoes, *b*, to correspond to screws.

7. Bending field shoes, inside diameter, 1½″.

8. Filing off part of field shoes, to allow field posts to rest on them.

9. Assembling the parts of the field.

10. Cutting strips, *c*, for armature core; 50 pieces, ⅜″x1½″.

11. Drilling $\frac{3}{16}$″ hole thru center of these strips.

12. Fitting strips on to $\frac{3}{16}$″ brass shaft, *f*.

13. Making commutator, *d*; cutting brass tubing ⅝″ inside diameter into four equal segments, *d*, each segment to be held down by two flat-head wood screws, No. 1, ¼″, brass.

14. Making four armature coils.

15. Making four field coils, *g*.

16. Soldering commutator to armature.

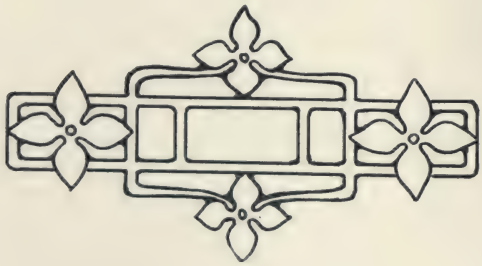
17. Making end, *U*, and side supports, *L*, of armature.

18. Making two supports for outside of motor, and wood base.

19. Making racking arm, *P*, and commutator brushes, *S*.

20. Assembling all parts of motor.

21. Supply two dry battery cells.



THE EDUCATIONAL SURVEY OF CLEVELAND—I.

W. E. Roberts.

THE origin, purpose, general scope and conduct of the Cleveland Survey were summarized in an editorial in the September, 1915, number of the Magazine. This editorial comment might appropriately serve as an introduction to a series of brief articles upon the report of the Survey.

The report of the Educational Survey of Cleveland is to be given to the public in twenty-five sections, in the form of monographs, each dealing with a separate phase of the work. Four sections have appeared at the present writing.

Cleveland is a typical large industrial city. The Survey has been accomplished by a group of experts in statistical and the various phases of educational work, who have formulated and reported directly upon their findings, entirely uninfluenced by outside considerations. The work therefore differs from other surveys of anything like the same magnitude, where data has been collected by expert or volunteer workers to be formulated and reported by others.

The general spirit of the report seems to be just and fair, as far as can be gathered from the sections that have appeared—adversely critical and commendatory. The findings which do not reflect credit upon the Cleveland schools do not necessarily deal with conditions peculiar to Cleveland, but in many instances, perhaps in most, could be applied to the educational policy of other cities of the same class.

It is the purpose of the present articles to give a brief review of the different sections of the report in the order in which they are presented, treating more fully those which should be of particular interest to industrial workers in the schools.

CHILD ACCOUNTING IN THE PUBLIC SCHOOLS.

LEONARD P. AYRES.

As the title suggests, this section of the report deals largely with school statistics, and reflects the general inadequacy of such statistics, altho the report, in many respects, attributes to Cleveland statistics of greater significance than usual in large cities. It particularly emphasizes greater care and more efficient methods in taking the annual school cen-

sus, and the necessity for utilizing in the improvement and development of the schools the valuable information which the census makes available. A more complete census would increase materially the income of the schools, as the money received from state funds depends upon the number of children enumerated; it would act as a check upon compulsory education laws; would be valuable in determining the ages and grades at which children leave school; would serve as a check upon statistics gathered thru the schools; would reveal facts with respect to the enforcement of compulsory education, and would serve as a means of gaining important knowledge of children from fifteen to eighteen years old, not accounted for in school statistics.

The Survey recommends the establishment of a permanent Division of School Census and an improvement of its methods, modification of school records to give more nearly the real facts, the support of the compulsory education law, increase in the thoroness and efficiency of the Truancy Division and compliance with the law requiring health certificates for children who receive working papers.

This section, with its tables and diagrams, suggests infinite possibilities in solving the problem of misfit, over-age, and slow pupils by caring for the individuals thru abridged and amended courses of study.

HEALTH WORK IN THE PUBLIC SCHOOLS.
LEONARD P. AYRES AND MAY AYRES.

The Survey argues for health work in the schools on the ground of the dependence of education upon health conditions. Cleveland spends $36,000 annually upon physicians, nurses and supplies for her eighty-six school dispensaries, because it pays. The aim is two-fold; prevention and cure. Not only have epidemics been checked or avoided, but incidentally notable changes have taken place in the cleanliness of children and in the homes. Medical inspection has revealed the fact that much of the trouble of so-called "backward" children is due to removable physical defects. The report discusses somewhat fully the objections to medical inspection and the right of the schools to require such inspection. It gives a brief account of the development of the work in Cleveland, and of the present organization which "handles inspection of contagious disease, inspection for physical and mental defects, follow-up work for remedying of defects, health instruction, recommendation of children to school for mentally and physically handicapped, school lunches, gardens, and playgrounds."

Cleveland is credited with a superior system of health work, well developed in the details of organization, prepared for useful leadership in the future development of the work in this country.

WHAT THE SCHOOLS TEACH AND MIGHT TEACH. FRANKLIN BOBBITT.

This section of the Survey report should be of interest to every worker in industrial education and is worthy of careful reading in its entirety. It is rather severely critical of much that it finds in the schools, but it is characterized by suggestion rather than by criticism. The point of view is broad, expressing in all the subjects the thought that has always, consciously or unconsciously, been the motive that has inspired the manual training worker—the education that has as its basis human activities and the life experience of the child. "Only as knowledge is put to work is it really learned or assimilated." The various school subjects are discussed somewhat fully under separate heads.

In reading, much less time should be given to intensive study and analysis of literary selections, and more time to diversified reading for its content value—history, industry, inventions, biography, etc. Literature as such should concede something to the reading dominant in adult life, that which deals with human affairs and the acquisition of information. The amount of reading should be greatly increased, particularly in high school.

Two points are emphasized in spelling: correct spelling of the writing vocabulary and the habit of using the dictionary when in doubt. Most people spell only as they write, and need only a limited vocabulary. Those to whom spelling is a vocational necessity need intensive specialized training.

In language too much time is devoted to grammar under the mistaken impression that this knowledge serves in everyday expression. Facility in expression is developed largely thru practice and imitation of good models, and grammar is a relatively small factor in eliminating and avoiding error. Emphasis should be given to oral and written expression dealing with reading, history and geography, and to a larger extent with the affairs of life.

"The content of mathematics courses is to be determined by human needs." Preliminary practice and fundamental processes should be given early as preliminary to mathematical thinking. The application should come largely in fields and subjects other than those of the mathematics

classes. Much of the spirit of the work recommended is found in the new course of study. Algebra should relate more fully to practical matters and be developed with geometry and trigonometry. Geometry should begin in the kindergarten and continue thru the grades, developing form and number relation that find application in other school activities, and lead to algebra and geometry.

"History should be so taught that it will have a demonstrable, practical purpose." In grammar and high school grades it should serve as a background against which to develop an analysis of present-day social conditions. This involves preliminary studies for general relations requiring familiarity in the large with ancient and modern history. In this connection, much and rapid reading should be given for historic perspective and should continue with the study of history in its social relations.

Comparatively little work in civics is found by the Survey, and very brief comment is made. A civic survey is recommended as a basis for work in the grammar grades.

Geography is becoming more and more a humanizing and socializing factor in education. Reading in abundance should be the fundamental medium together with a large amount of illustrative material and apparatus. The textbook should be considered merely a book of reference. Much supplementary reading material is essential to a high type of work in geography. Cleveland is credited with progress in this subject.

Drawing and applied art in the schools are generally commended. It is suggested that there should be a greater realization of the fact that they furnish a means of expression of practical significance in the present age, which the use of schoolroom exercises does not help the pupil to utilize in the world of practical affairs. There should be greater cooperation between teachers of art and manual training and between both and the community at large.

The justification for the various forms of household arts in the schools is easily seen. Woman's occupations in the home are unspecialized and each does much the same things as others. To give household arts to all girls is logical. Manual training for boys is a much more difficult problem. Man's work is almost wholly specialized. Shall boys be given a variety of specialized occupations of "some less specialized sample out of that diversified field?" The report commends Cleveland's work in household arts as meeting fairly educational and social demands. It justly implies that there is lack of diversity and social purpose in manual training for boys who do not attend technical or special schools. Voca-

tional guidance and diversity of occupation are suggested as means of giving social purpose to manual training. Printing and gardening are recommended as additions to the manual training program. The report does not suggest how vitalization is to be accomplished in the brief time allotted to grammar grades, or that more time be given to the work. It does suggest that the problem is complicated and that the solution looks to the whole program.

Elementary science is found wanting. The schools should supply the understanding that future citizens will need of practical scientific phenomena of everyday life. Health teaching should have a more definite place in the course, under advice and assistance of school doctors and nurses. Physical training needs more facilities for outdoor and indoor games. Music is barely mentioned in the report. Foreign languages are briefly discussed in relation to high schools.

In general where Cleveland is backward is that much of its work fails to take the social point of view. The report recommends avoidance of uniform courses of study and methods of teaching and adoption of differentiated courses to meet the needs of widely different types of children in different sections of the city.



MADE BY STUDENT AT TECHNICAL HIGH SCHOOL, CLEVELAND, OHIO.

EDITORIAL COMMENT

ON several occasions we have called attention to methods of advertising vocational school classes. The latest one that has come to our notice is the first issue of a very pleasing little magazine "written and edited by the classes in journalism, advertising, and salesmanship of the Vocational Night School, and printed by the Prevocational School," Richmond, Virginia. It is called *The Torch,* "a Journal of Inspiration for Those Who Work for Advancement." It is rightly named for it is full of bright sayings and illuminating facts—especially facts concerning the opportunities for vocational training in Richmond.

IF certain psychological experiments recently mentioned by President Charles W. Dabney, of the University of Cincinnati, are to be relied on, women are much better qualified to be sea captains than are men. Dr. Dabney mentioned these experiments in order to give emphasis to the fact that the science of psychology has thus far failed in determining the vocations of men and women. In fact, he is reported to have stated that psychological tests of the present time are "absolutely worthless as an aid to educational institutions." We take it, however, that this should not discourage any teacher from applying all the knowledge of psychology that he can muster to the vocational guidance of his pupils, but merely that psychology is not a mathematical or quantitative science in the same sense as chemistry, and that it is useless to expect from it quantitative results.

AT the Pan-American Congress recently held in Washington, Arthur Williams, of the New York Edison Company, made the following statement which caught our attention:

> The National Association of Corporation Schools represents a group of about 100 industrial schools. The million and more employes concerned are receiving by this means an education to a certain extent specialized and to a certain extent cultural, the whole making for higher degrees of usefulness.

It will be a surprise to many of our readers to learn the present extent of corporation school work as indicated by Mr. Williams. They may not, however, be as much surprised at his statement concerning the cultural results of such training, for it has become clearer, year by year, that the industries need men and women with more general education as well as more vocational education. That this corporation school leader

would emphasize this fact is evident from a statement that follows immediately after the one above quoted:

> So necessary is this training for the permanency of our institutions that some method must be considered through which every boy and girl may enter a chosen work, not as now from an average of the sixth grade, but instead with a definite degree of secondary education. A provision such as this will insure not only better industrial efficiency but a higher standard of personal attainment and citizenship.

THE strategic position occupied by the reorganized George Peabody College for Teachers, at Nashville, Tenn, is evident to anyone who has taken a look over the educational field, and this seems to be especially true as regards graduate work and instruction in certain special subjects. A recent bulletin from the College on "Opportunities for Graduate Study" tells the story well. There is no other institution west of Teachers College, New York City, which has equal facilities, and the single purpose of training men and women for such a wide range of positions in the field of education. Concerning graduate work it may be said that this college is fortunate in entering the field at this particular time when graduate study in education is coming to be regarded more and more as the proper gateway to the higher educational positions.

Geographically, also, the school is fortunate. It is between the South and the North, the West and the East, being just a little south of the center of the nation's population. It is therefore in just the right position to contribute to the solution of naional problems. Already it has nearly $1,500,000 expended in buildings, grounds, and equipment, and with Vanderbilt University just across the street, and working in full cooperation, with the Nashville public schools helping, with an especially strong faculty, Peabody at once takes its place as a leader among colleges of education. Add to this the fact that Peabody is organized on such a broad basis that graduate work in rural education, home economics, or industrial arts is just as possible as in English or the classics or school administration, and then the further fact that the cost item is less at Peabody than at any other school of equal standing, and it becomes easy to see why this institution is destined to exert a wide influence in the coming years.

THE discussion of the Gary plan continues in New York City. It does not seem to have yet reached the stage where prejudice is eliminated. Mr. Wirt looks upon work and play as educational in a degree almost equal with study; some of the schoolmen do not. The

city comptroller and a few others in authority insist that Mr. Wirt's plan be given a fair trial; others seem to believe that Associate Superintendent Ettinger's plan, which involves a scheme of prevocational work and half-day sessions for most pupils without radically changing methods of teaching, would bring better results.

To some it has seemed that the issue was clearly drawn between the older pedagogy and the newer; to others it has seemed a financial matter, but there are so many questions of organization and personal efficiency in carrying on the experiments, as well as predjudices to overcome and methods to revise, that the issue is still very much clouded. The smoke of strife has not cleared away, and may not soon. It is even possible that Mr. Wirt's scheme involves elements that he himself has not yet mastered. The general principle may be sound, but the application defective. It may take years of developing to prove its efficiency or inefficiency. We have been interested in a quotation from a recent letter written to Dr. Ettinger by Alfred P. Fletcher, Assistant Superintendent of Schools in Rochester, N. Y., which was published in the *Brooklyn Eagle*. It is as follows:

> Since returning from New York I find myself going over and over again the many features of prevocational work that I saw in the schools of New York and Brooklyn. In my judgment your prevocational schools are doing an exceptionally fine piece of work. The equipment is that which the boys will use hereafter in the industries. Your teachers are masters of their craft. The boys are turning out a real product, and, above all, they are getting the industrial value out of each piece of work they are doing. I want to congratulate you most heartily on the work you are doing.

The fact that Mr. Fletcher is a competent judge of shopwork and drawing adds much to the value of this opinion. On the other hand, this does not prove that the Ettinger plan as a whole is superior to the Gary plan. This leads us to ask a question which has come to our minds almost every time we have heard the Gary system discussed by manual arts teachers. Is not the shopwork the weakest point in the Gary system? And would not the system as a whole be greatly strengthened if the shopwork part of it were to be changed by having infused into it more of the elements of practical pedagogy?

OF CURRENT INTEREST

THE PAN-AMERICAN SCIENTIFIC CONGRESS.

THE Pan-American Scientific Congress held a notable session in Washington from December 27th to January 8th. The results of this Congress may deeply affect the political life of the American nations because it has seemed to clear up certain questions of political motive and policy and to establish confidence as no similar gathering before has been able to do. Without a doubt the American republics are nearing the stage of practical cooperation in many matters of national importance and, as President Wilson has so appropriately pointed out, the growing friendship should be based upon a community of thought and purpose. "When men come to know each other and to recognize equal intellectual strength and equal intellectual sincerity and a common intellectual purpose, some of the best foundations of friendship are already laid."

The section of the Congress devoted to education was under the chairmanship of Commissioner Claxton of the United States Bureau of Education and the industrial education sub-section under a committee of which Dr. Bawden of the Bureau was the chairman. The other members were Commissioner David Snedden of Massachusetts, Dr. C. A. Prosser of the Dunwoody Institute, Minneapolis, and Charles A. Bennett of Bradley Institute, Peoria, Ill. Among the speakers in the sub-section were Dean Davenport of the University of Illinois, Prof. John Dewey of Columbia University, Mrs. Mary Schenck Woolman, and other representatives of the industrial education movement in the United States, along with equally eminent men representing the visiting nations. As may have been expected, most of the papers dealt with the large, inclusive problems of administrative policy and principles. Among such Professor Dewey's address on "The Need of an Industrial Education in an Industrial Democracy," was notable, and we are pleased to be able to present this in full to our readers.

It was a noticeable fact that the South American speakers recommended a government system of industrial education somewhat independent of the elementary schools, tho they emphasized the importance of an adequate elementary school system as a foundation upon which to build the industrial school system. The reason for recommending the separate control seems to be explained in the address, "On Pan-American Understanding," made by Dr. José M. Gálvez, professor of English in the

University of Chile and vice-president of the National Educational Association of Chile. He drew attention to the two types of European culture to be found in America which he called the insular or individualistic and the continental or collective.

> You of the United States have, as an essential feature of your culture, the inheritance of British individualism which you have made to flourish on the American soil of the North, where it has borne wonderful results through the splendid activities of great individuals.
>
> We of Latin-America have the collectivism of continental Europe, as an essential feature of our cultural inheritance, which we have developed in the Southern lands of America. Whatever has been achieved there—and there has been much—has been done mainly by the governments. People look up generally to the governments for whatever is yet to be achieved—and that is still a great deal more.

In discussing the question, "What Should be the Place of Industrial Education in the School System of the American Republics," Alfredo Samonati, of Uruguay, gave as one of his conclusions that:

> Industrial education should be organized in a separate system, under separate control, harmonized, however, in such a way with the elementary schools as to offer a natural bridge for those who wish to go from the latter to the former.

Harold E. Everley, recently head of the Woodworking Department, Escola de Eugenharia, Porto Alegre, Brazil, and now completing his work for a degree at Bradley Institute, in a paper on "Industrial Education in Latin America," gave emphasis to the importance of making industrial education a function of the elementary schools, and then added:

> Considering social conditions in these republics, the industrial secondary school should be given a system and a control independent of that of other secondary schools. The industrial school, like most secondary institutions of learning, is, and should continue to be, supported by the Government. With such maintenance this school is able to offer many advantages, but the good results would be increased by the establishment of a more vital relationship of the schools and industry through an administrative board including representatives of the elementary school, of the Government, and of the industries, and by a stronger cooperation of the school with parents and pupils through an advisory board which supplies free information concerning wages, possibilities, etc., in the various occupations.

At least one of the reasons for these statements concerning control seems to be found in the dominant type of culture in Latin America pointed out by Dr. Gálvez in the passage previously quoted.

TRAINING TRADE TEACHERS AT INDIANA UNIVERSITY.

In the Spring of 1915, announcements were sent throughout Indiana to carpenters, printers, pattern-makers, electricians, and machinists;

and to dressmakers, cooks, milliners, and saleswomen, stating that two courses of two weeks' duration in the theory of teaching trades would be given in Indianapolis from July 5th to 17th, under the auspices of Indiana University. Miss Cleo Murtland of New York City, and Egbert C. MacNary, of Springfield, Mass., had already been engaged as instructors. Applications were received from about 30 men and 75 women; and 13 men and 21 women were accepted and enrolled. Owing to the illness of Mr. MacNary the course for men was abandoned, but the course for women was carried to a successful consummation. Miss Murtland's plan involved (a) fifteen lectures and discussions relative to teaching and the organization of subject-matter; (b) six lectures by representatives from stores and shops; (c) one evening dinner and program; (d) visits to shops, stores, and schools; and (e) reports of committees on courses and demonstration teaching.

Based on her experiences with this summer class Miss Murtland formulated recommendations for future courses of this kind. Some of these are as follows:

FUNDAMENTAL PRINCIPLES OF ORGANIZATION.

1. Experience and personality are the two factors upon which to determine eligibility for admission to such training classes.

2. Since the trades, especially those employing women, are not standardized to the point of having what stands for an apprenticeship, there is no accepted standard of workmanship by which to measure trade experience. The selection of tradeswomen for training classes should be made on basis of: (a) length and variety of experience; (b) personality, including flexibility.

3. Provision must be made for testing the quality of the experience and the technical and manipulative ability of tradeworkers.

4. This experiment bears out the theory long held by the instructor that courses for tradeworkers can accomplish most if given to a homogenous group; that is, to trade teachers alone, and to professionally trained teachers alone, because, (a) like any group of people interested in the same line of work, tradeworkers think and talk in the language of their work. This does not mean a cheap lingo, as is sometimes advocated, but it does mean a non-technical language that will eventually find its way into the textbooks for these courses; (b) workers who are accustomed to work with their hands think in terms of things rather than in words, while with the teacher, the academic person, the opposite method is the easier method of thought or discussion.

5. Sound methods for teaching trade subjects—both the theory and practice of these subjects—will be sound, practical, and enduring only as they grow out of recognized trade methods and customs. Surrounding the tradespeople with the tools, materials, and equipment of their trades must then be a part of the natural and scientifice development of the theory of teaching the trades. Supplemented with visits to shops, working from time to time in the trade shops in the commercial world, this method of study can be kept alive and flexible.

RECOMMENDATIONS FOR FUTURE WORK.

1. Form two groups of students as follows:

Group A. Continue the method of selecting only those persons having real trade experience for the student body of the courses for teachers of trade subjects, setting the trade requirement not less than two years; four or five years would be safer.

Group B. Form another group from the teaching field, running the courses parallel, but not together. These persons should be selected upon the basis of technical training plus practical experience in the school as a teacher or as a worker in the trades.

2. Deal with the two groups as follows :

The Trade Group. Emphasis in instruction should be laid upon trade methods and how to teach. The course should (a) test the quality of the trade knowledge, (b) develop methods for teaching trade subjects, making it possible for these methods to grow out of trade experience.

The Technical Group. Emphasis in instruction should be laid on acquiring trade experience and checking up technical training. The course should (a) test the quality of technical training, (b) add to and test practical experience in production work, (c) stimulate interest in trade subjects and the importance as well as dignity of manual skill.

3. Teaching groups should be made for single trades.

4. The course should be lengthened to four weeks if possible.

5. Experience bears out the theory that such courses bring the best results when presented in an industrial center.

At a "trade teachers' dinner" held in October, during the meeting of the State Teachers Association, sixty-five persons were present, among whom were several speakers from outside the state who are vitally interested in the problems under consideration. John A. Lapp, of the Indiana Bureau of Legislative Information, spoke of the absolute necessity of having teachers thoroly familiar with actual trades, contending that theoretical teachers will never be satisfactory. He indicated that the method of evaluating trade experience could not be worked out without considerable experimenting, and that standards must not be too high. A standard must be erected for each occupation, and we must provide teachers for all types of pursuits—skilled, semi-skilled, and unskilled.

Dr. Arthur D. Dean cited his seven years' New York experience with the problem, indicating that even now he had reached no definite conclusion as to the sources from which trade teachers should be drawn. He said that they obtained some good teachers and some poor teachers from the trades, citing the example of a cabinet-maker who applied for a teacher's license who did not know the various kinds of joints used in constructing an ordinary table. He cited another example of a man who

had worked seven years in a machine shop and applied for a machinist teacher's license. The man was not a machinist but a machine operator.

In a report of the Indiana experiment in the training of trade teachers written by Prof. Robert J. Leonard, who has had the whole matter in charge, dated December 28th, he makes the following brief statement of results:

1. Groups of the highest type of tradesmen and tradeswomen can be formed for the purpose of seriously and intelligently studying the professional aspects of teaching.
2. In the professional training of tradesmen for teachers, provision for technical shop and trade work and drawing are necessary.
3. Practice teaching is necessary during the period of training.
4. Splendid results may be achieved in a two weeks' session, but, if possible, the term should be extended.

THE MANUAL ARTS IN 156 CITIES.

The December number of *Educational Administration and Supervision* contains a brief summary of the results of a "questionnaire study of certain phases of the teaching of the manual arts and home-making subjects in the elementary schools and in the high schools of 156 cities of the United States." This study was made by Joseph C. Park, of the Oswego Normal School, and Charles L. Harlan, of the State Normal School at West Chester, Pa. The investigation covered the following: "The dominant aims and prevalence of each in the teaching of the manual arts and home-making subjects; kind and character of work offered; number of minutes per week and percentage of total school time devoted to these subjects; methods used and their adaptation to the age and grade of pupils; and methods of disposing of the products of the shops and kitchens."

The findings of the investigation are to be issued in bulletin form by the United States Bureau of Education, but in the meantime our readers may be glad to get the following statement quoted from the above-mentioned summary:

The kinds of work offered are grouped into nineteen general classes. The number of cities offering each kind and the grade in which it is offered are shown in tabular form. From these figures one is enabled to see what kinds of work are emphasized and in what grades the greatest emphasis is placed on any specific kind of work. A striking fact gleaned from this part of the report is the wide range in the kinds and grade location of the work offered.

Some interesting facts appear in the tables on periods per week, total minutes per week, and percentage of total school time given to manual arts and home-making subjects. The central tendencies show the common practice to be

that of giving one period per week of 70 to 90 minutes in the grades, and in the high school, five periods per week of about 75 minutes, to these subjects. The time thus given is found to be about 5 percent of the total school time in the first six grades, about 6 percent in grades seven and eight, and nearly 25 percent in the high school.

The methods employed in presenting the work are designated as those of systematic graded exercises, individual projects selected by the pupils, cooperative projects selected by the group, and projects expressive of some phase of work in arithmetic, history, literature, or other subjects. The one method in greatest favor is that of systematic graded exercises, this method being used alone in 17 percent of the cities studied. The most frequent combination is that of systematic graded exercises together with individual projects, found in 23 percent of the cities. Other combinations of methods appear nearly as frequently, however, showing that there is only slight tendency towards uniformity in the use of any one method or group of methods. The use of some methods is also more frequent in some grades than in others, indicating a tendency to adapt the method of presentation to the age and grade of the pupils.

The data on the disposal of the finished products indicate a strong tendency towards individual work since 40 percent of the cities allow pupils to keep the products of their handiwork. The tendency to dispose of such products by sale is so slight as to be almost negligible.

Data on enrollment in manual arts and home-making courses, costs, and amount of correlation with other subjects, have been collected but are so fragmentary and disorganized as to render them unreliable.

The report presents data of much significance to superintendents, supervisors, and teachers of manual arts and home-making subjects.

ADAPTING MANUAL TRAINING TO RURAL CONDITIONS.

At the meeting of the Industrial Section of the North Dakota Educational Association, held at Grand Forks, November 3rd, 4th and 5th, Prof. Veron E. Sayre, head of the Manual Arts Department of the University of North Dakota, gave an address on the adaptation of manual training to rural conditions. Professor Sayre believes that it is of vital importance to the future prosperity of his state that rural instead of urban ideals and industries should be factored in the schools of North Dakota. The following paragraph is quoted:

> This last summer I heard a teacher of the state say that many of his co-workers were not in harmony with country life, and as a result, either consciously or unconsciously, they were influencing their pupils away from the farm. One can hardly believe this is a fact, at least it is to be hoped that it is not; for should this be a general condition, it would be difficult to conceive of a thing ultimately more disastrous to the state. Should the larger number of our young people decide on other occupations than farming, they must necessarily flock to the cities; and because of the small urban population which the development of this state would support, they must of necessity leave it that they might follow

their vocations under favorable environments. Thus, the proceeds from the investment which this state is making in public education would largely fall to other states, and the development of her agricultural resources would largely be left to the newcomer, who must go thru a process of adaptation before he becomes a valuable citizen. Should there be teachers among our number who are not in sympathy with country life, may we not hope that they will either seek other occupations or betake themselves to communities where they will be more in accord with their surroundings. It is true that there are objectionable features to country life, but these problems can be largely solved, and their very presence constitutes a challenge to young people of ability and energy. Both teachers and educational methods should, in agricultural districts, be dedicated to the cause of efficient rural development. To this end I believe there is no subject taught in the state more valuable than manual training if it is properly handled.

This statement is followed by suggestions concerning the adaptation of benchwork in wood, carpentry, concrete, and metalwork to rural conditions:

In teaching benchwork it should always be kept in mind that the proper handling of tools, or tool operations, should receive first attention; but in imparting this knowledge problems of rural interest may be used which will be more attractive to the country boy, and will give him more practical ability in the handling of his tools than the footstool-taboret furniture making course of the usual kind. Little emphasis need be placed on the more complex joints used in furniture making, leaving more time for special attention to simpler construction. There are many valuable problems which involve only the butt joint, such as poultry coops and automatic feeders, different sized measures, nail boxes, fly traps, hens' nests, milk stools, farm gates, rabbit traps, etc. Also there are numerous problems involving the groove and cross-lap joints, among them being sleds, ladders, step-ladders, laundry benches, wagon jacks, saw horses, hog troughs, and as large undertakings as hay racks. It would not be necessary to hold all pupils to such problems; in fact each one should do some of the finer work as well, but the underlying thought is that the pupils will develop the ability to handle problems most likely to be encountered on the farm, and will be drawn out toward one of the attractive sides of farm life.

While well equipped shops are desirable, one bench with tools in the hall of the school building, where the boys, one at a time, may work with occasional assistance from the teacher, may bring valuable results, provided the teacher is qualified to furnish the assistance. In like manner, the teaching of elementary carpentry largely depends on the ability of the teacher, and the equipment would be less than that required in teaching the same number of boys in benchwork.

Instruction in carpentry construction is usually handled in one of three ways: (1) complete buildings are made in miniature, each piece of material being to a scale; (2) a small portion of a building, say a corner which includes part of a door or window, is made of full-sized material; and (3) an entire building is constructed and full-sized material is used. It does not take much argument to convince one that the last method is best, for it not only gives the workman a chance to handle the full-sized stock in a workmanlike way, but it also has the

vital element of making something which has value of itself and can be put to practical use. One objection to this method is that problems must be had which can properly be disposed of. However, in almost every community persons can be found who will be glad to furnish the material for small buildings, such as poultry houses, garages, coal houses, etc., and then remove them from the school grounds after completion. In working out such problems practice can be had in framing (including roof framing), boarding in, roof covering, outside finish, door and window casing, door hanging, flooring, ceiling, and like operations. When, at appropriate times, talks and explanations are given on applying these methods of construction to larger buildings, the value of the work can be greatly increased. Knowledge of this kind is worth while to any boy, but especially to the one who will be located on the farm.

Emphasis is then given to concrete as a building material for the farm, and to such metalwork as can be done with a simple blacksmith shop equipment and space to repair farm machinery.

ONE PLACE WHERE MANUAL TRAINING IS NOT NEEDED.

Some of our readers may recall that two years ago we announced that Francis J. Bohl had given up a manual training position in Minnesota and gone to the Samoan Islands to take charge of a government school. He went equipped with scientific and pedagogic training, and all the enthusiasm of a successful teacher of the manual arts. He went also with an ambition to work out a scheme of education especially suited to the people of those far-away islands. The following excerpt from a letter written in October is of interest because it gives reasons for his conclusions and is the result of experience.

I am prepared to make the statement that there is one place, at least, in the world where manual training has no place. This may seem heresy at first glance, I know, but I think it is true in Samoa.

Unless I have missed the whole point of industrial education, it has no meaning unless it bears a very direct relation to the needs present or future of the pupils. I don't think a course in handwork is any more industrial than a course in Hebrew, if the material of the course is not to be useful. I don't believe in putting handwork in the curriculum for the mere sake of having it there, as something to which we may point with pride, to prove that we are up to date and ministering to the industrial needs of the pupils. So my problem was to find out what the Samoans should learn to do with their hands.

Naturally woodwork came first to my mind. But Samoans have no furniture in their houses, no beds, no chairs, tables, taborets, coat-racks, book cases, or fern-stands. Their houses are beautifully made, after a plan which they have evolved thru generations—a substantial, satisfactory structure, showing wonderful adaptation of the materials at hand to the needs of the climate—but what we call tool

processes do not enter into their construction. Would it be worth while to equip a shop and offer instruction in handwork which will never be used? But perhaps we should civilize these aborigines, and give them tastes for our sort of houses and furniture. When they shut themselves in walled houses, and put clothes on their backs, and ape the customs of white men, the hospitals are filled with cases of consumption.

Shall it be agriculture, then? Men who know the people, missionaries and others who have lived for many years in Samoa, tell me that they would not presume to tell a Samoan how to plant and care for their taro, bananas, bread-fruit, and cocoanuts or how to cook them. They can give no points on the weaving of mats and baskets. Education for commercial life stands in much the same position as the woodwork. There are a few openings for clerks, just as there are for carpenters and boat-builders. But the place is so small, and such opportunities are so few, that not one boy in a thousand could be placed. And since Samoans never leave the Islands, they could not hope to find use for their training elsewhere. I can see where work in sewing can be made very practical, but that doesn't help the situation as far as the boys are concerned.

Here is my opinion about the whole matter: the really practical education will give the people a good working knowledge of arithmetic, emphasis on weights and measures in use, U. S. money and the fundamental operations; geography, to give them an idea of the world outside their narrow limits; and above all, the English language, thru which alone they can come in contact with all fields of knowledge. There is no literature in the Samoan language; in fact they had no written language at all until the missionaries made it for them about 70 years ago. My idea would be so to school them as to send them back into the houses they came from, prepared to lead intelligent, full and happy lives broaden themselves, keep up with events in the great outside world, deal intelli-broaden themselves, keep up with events in the great outside world, deal intelligently with white men, take care of their bodies, and behave themselves according to enlightened standards, but all in their own environment.

To put my thought in a few words, it seems that the Samoan problem is our problem reversed. We suffer from an over-dose of civilization, too much books and so-called culture, and not enough objective experience; whereas the Samoan lives very close to nature, is forever handling things and educating his senses, but needs more of the abstract and informational.

I really feel that there isn't a place for a regular course in handwork in Samoa. From time to time something comes up, which furnishes an opportunity for a little instruction in this direction. Some months ago, the boys decided they wanted to build a store room from the kindling-wood which remained when an old barn on the place was razed. So we built a 15′x18′ room with a 6′ veranda across the front, of which the boys are very proud. Again, they wanted to make some spending money, so I bought a lot of vegetable seeds, and we made a good-sized garden. I would not call such spasmodic efforts as these organized work.

To be sure, the whole discussion is of only academic interest, since if manual training were ever so desirable and necessary, it would be impossible to get an appropriation for equipment. I am pleased beyond expression to have chalk and blackboard erasers.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

BIRD HOUSE NUMBER.

The editors believe that the bird life of our nation should be a matter of concern to everyone; that the boys who are interested in studying the life and habits of birds will do their share for bird protection, and that the proper person to help the boys and girls to make houses, etc., to attract birds, is the teacher in charge of the shop. For that reason a competition was announced in the November number of this Magazine to secure material that might be of service to teachers interested in the movement. While the material has been passed upon by judges, and prizes awarded, it is evident that the real jury will begin to arrive from the South in a few short weeks. Some houses may remain "for rent" all thru

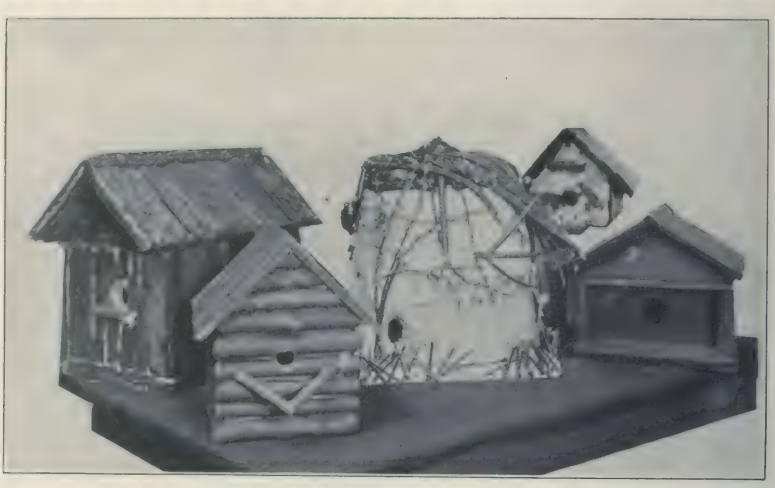


FIG. 1. RUSTIC HOUSES.

the coming Summer, but that does not of necessity pronounce them a failure. Birds in sufficient numbers must become accustomed to the new homes before all can be occupied. As birds reared in our houses increase, we may expect a greater disposition to inhabit shelters erected for them. Again, freedom from enemies such as cats, sparrows, and the boy who has never made a bird house, is necessary to insure success.

The following prize-winners are announced:

First prize—Donald V. Ferguson, Supervisor of Manual Arts, St. Paul, Minn.
Second prize—Frank H. Ball, Director, Industrial Education, Pittsburgh, Pa.
Third prize[1]—C. M. Hunt, Director of Manual Education, Milton, Mass.
Third prize—Leon H. Baxter, Director of Drawing and Manual Training, St. Johnsbury, Vt.

[1] Two third prizes were awarded.

Honorable mention—Elmer Knutson, Director of Manual Training, St. Cloud, Minn.
Honorable mention—H. A. Hutchins, Assistant Principal, East Tech. High, Cleveland, Ohio.
Honorable mention—George G. Grimm, the Park School, Baltimore, Md.
Honorable mention—Edw. G. Anderson, Mercer Industrial Center, Seattle, Wash.

ST. PAUL, MINN.

Each year a bird house show is held by the St. Paul public schools which has surpassed the annual automobile show in magnitude. This year it will be held in the auditorium which seats 10,000 people and the exhibit planned will fill the building.



FIG. 2. STUCCO HOUSES.

Fig. 1 shows houses of the rustic type made from readily obtainable material. The center house was made of an inverted pail covered with birchbark and pussy willows. A partition is placed half-way up to make it a two-family house, and ventilating and cleaning devices are provided.

Fig. 2 illustrates a group of stucco houses built to match the general design of garages, etc., in the best residence districts.

Fig. 3 gives a view of the palm garden of the exhibit where the victrola gave out the song of the nightingale and other birds. All of the bird baths, etc., shown in this illustration were sold and many orders were received.

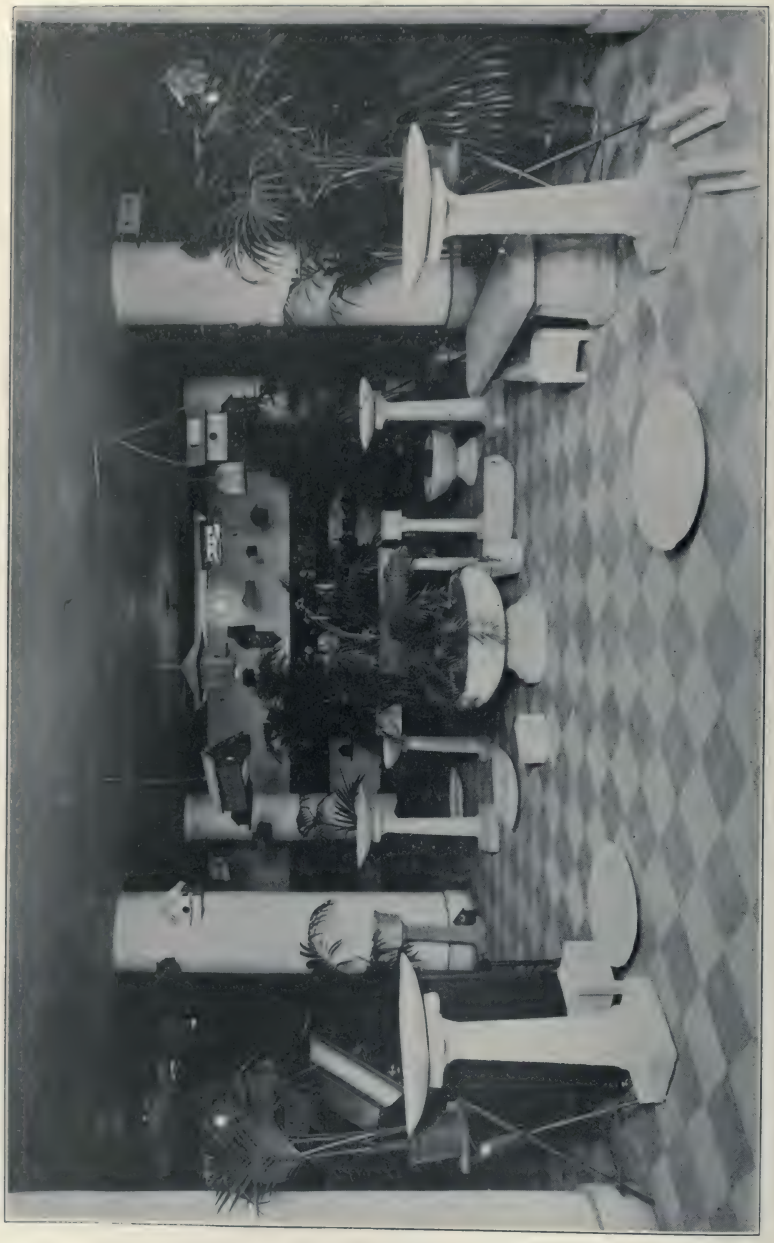


FIG. 3. THE PALM GARDEN EXHIBIT.

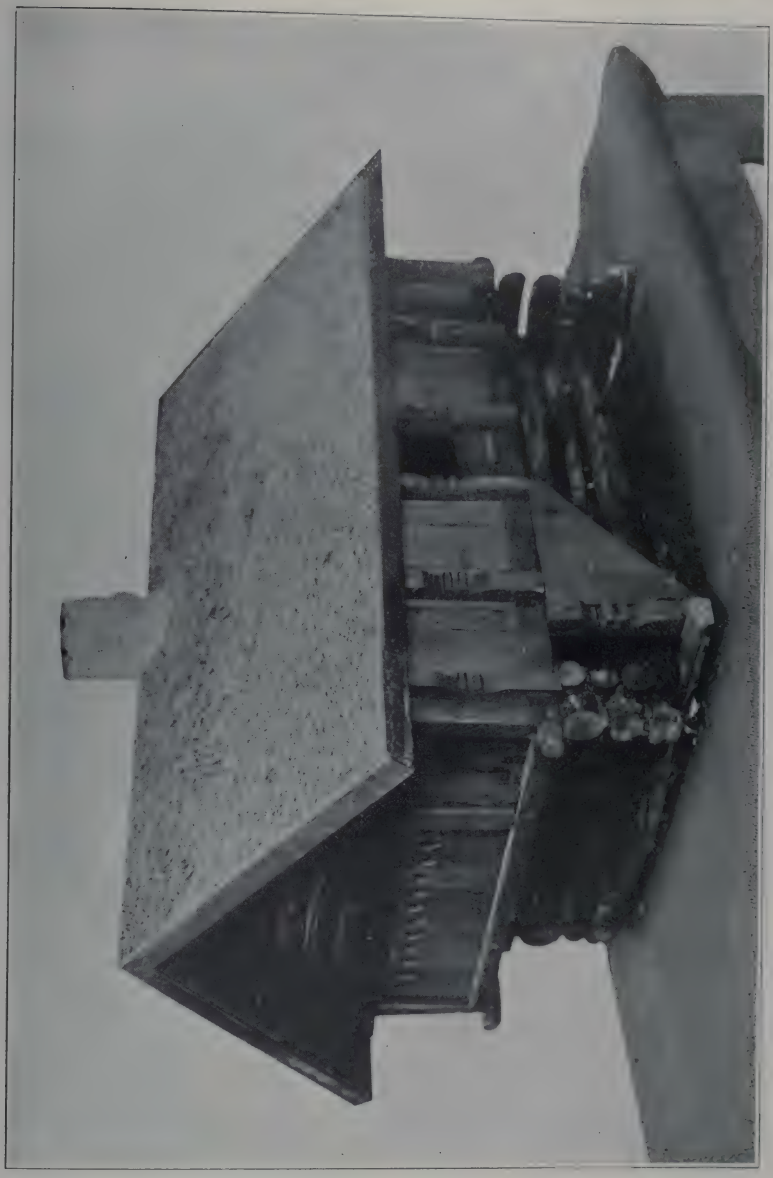


FIG. 4. THE PERE GYNT COTTAGE FOR MARTINS.

Fig. 4 is a miniature reproduction of Pere Gynt's cottage for a martin house. This house was not only an attractive thing to make, but martins selected it for their home during the past summer.

PITTSBURGH, PA.

Allegheny County, Pa., probably leads the country in the production of bird houses, approximately 15,000 having been made last year. In a short bird campaign the public school boys of Pittsburgh produced 6,000, and for the Christmas season made a couple of thousand more. The department stores are sufficiently interested to offer prizes to encourage the boys, while the location there of one of the state game and fish commissioners, Mr. John Phillips, gives an opportunity to secure expert advice.



FIG. 5. RUSTIC HOUSES.

Figs. 5 and 7 show houses of the rustic type, each the idea of the boy manufacturer, following definite suggestions as to size of house, diameter of opening, etc.

Fig. 6 is a view of the Pittsburgh exhibit while Fig. 8 illustrates the prize houses, and their makers, entered in a department store contest.

The drawings were made from blueprints in use in the Pittsburgh schools, tho some of this material is found in Farmers' Bulletin No. 609.

Fig. 9 gives three homes for birds, together with diagrams of the proper layout of material.

Fig. 10 shows a martin house above, and a suet feeder below.

Fig. 11 illustrates, above, a home for house finches, and below, a food shelter house. In each case the habits of birds must be studied to locate these houses in proper places, and to so care for the details of construction that each house may be suited to the species of birds to be attracted.



FIG. 6. THE PITTSBURGH EXHIBIT.



FIG. 7. RUSTIC HOUSES.



FIG. 8. PRIZE-WINNERS IN DEPARTMENT STORE CONTEST.

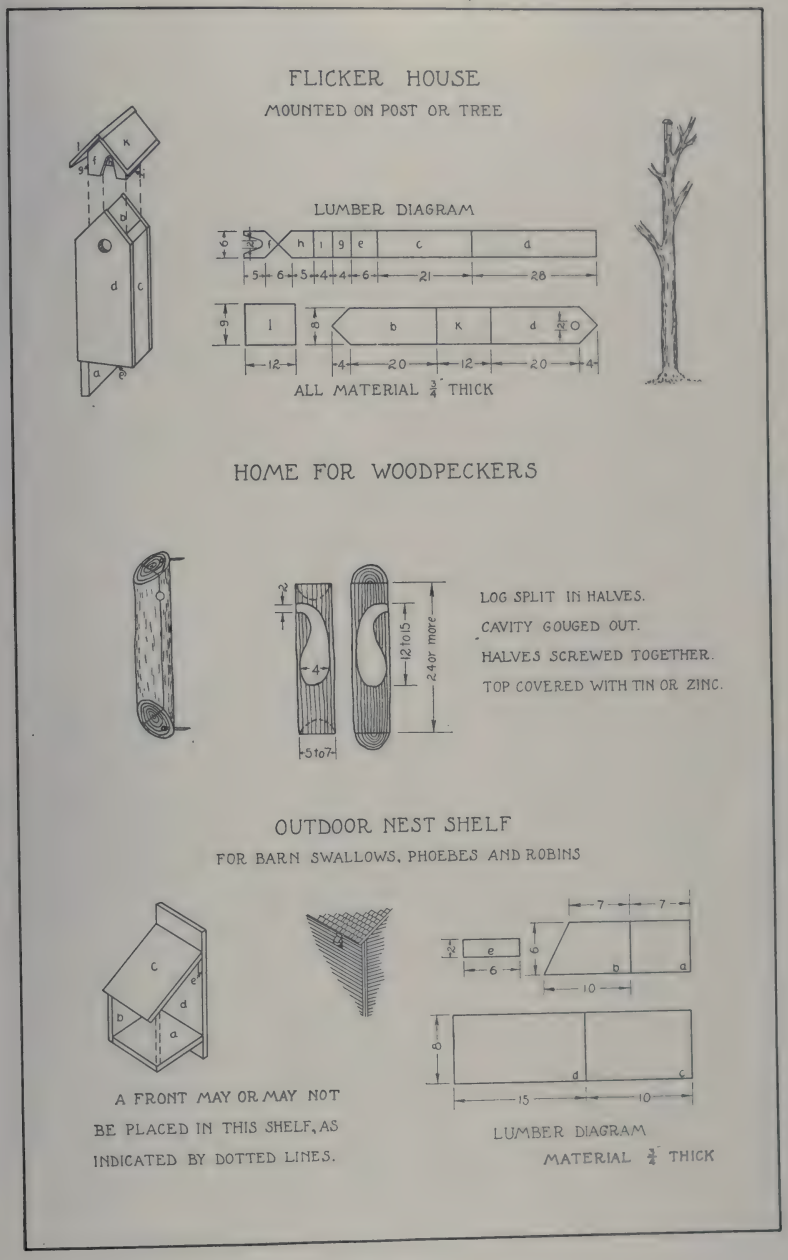

FLICKER HOUSE
MOUNTED ON POST OR TREE
LUMBER DIAGRAM
ALL MATERIAL ¾" THICK
HOME FOR WOODPECKERS
LOG SPLIT IN HALVES.
CAVITY GOUGED OUT.
HALVES SCREWED TOGETHER.
TOP COVERED WITH TIN OR ZINC.
OUTDOOR NEST SHELF
FOR BARN SWALLOWS, PHOEBES AND ROBINS
A FRONT MAY OR MAY NOT
BE PLACED IN THIS SHELF, AS
INDICATED BY DOTTED LINES.
LUMBER DIAGRAM
MATERIAL ¾" THICK

FIG. 9.

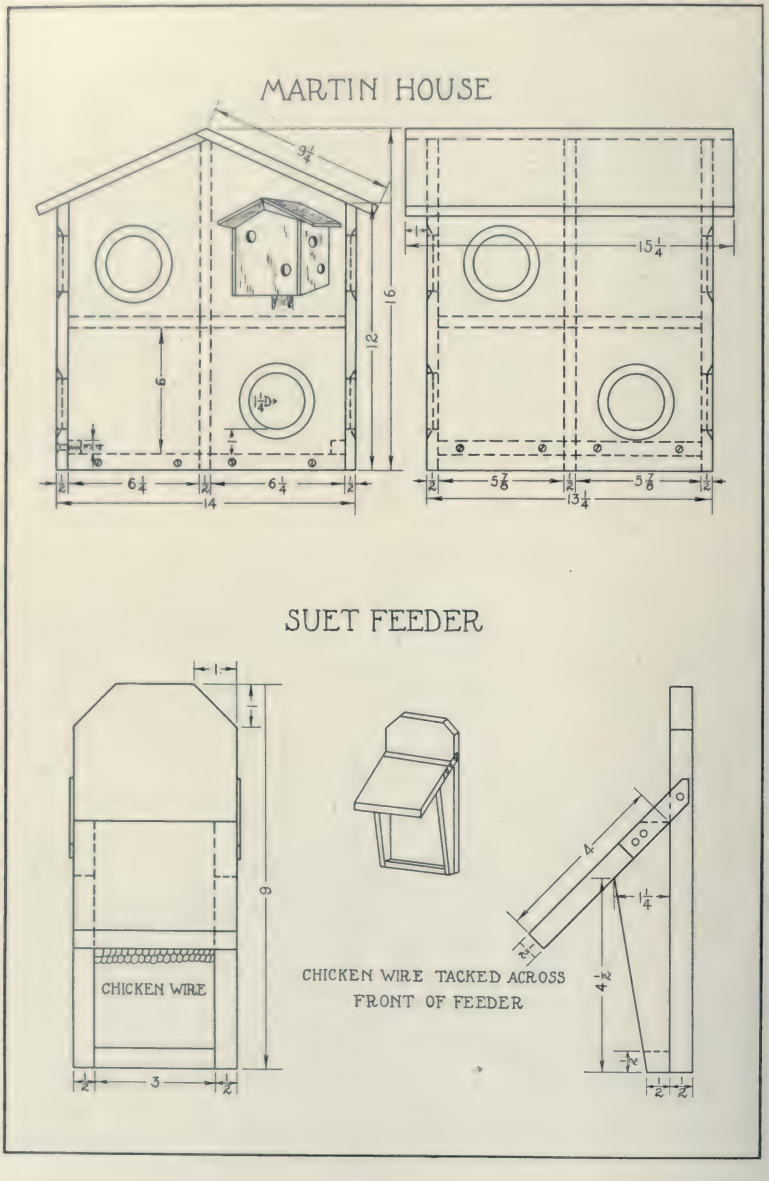

MARTIN HOUSE
SUET FEEDER
CHICKEN WIRE
CHICKEN WIRE TACKED ACROSS
FRONT OF FEEDER

FIG. 10.

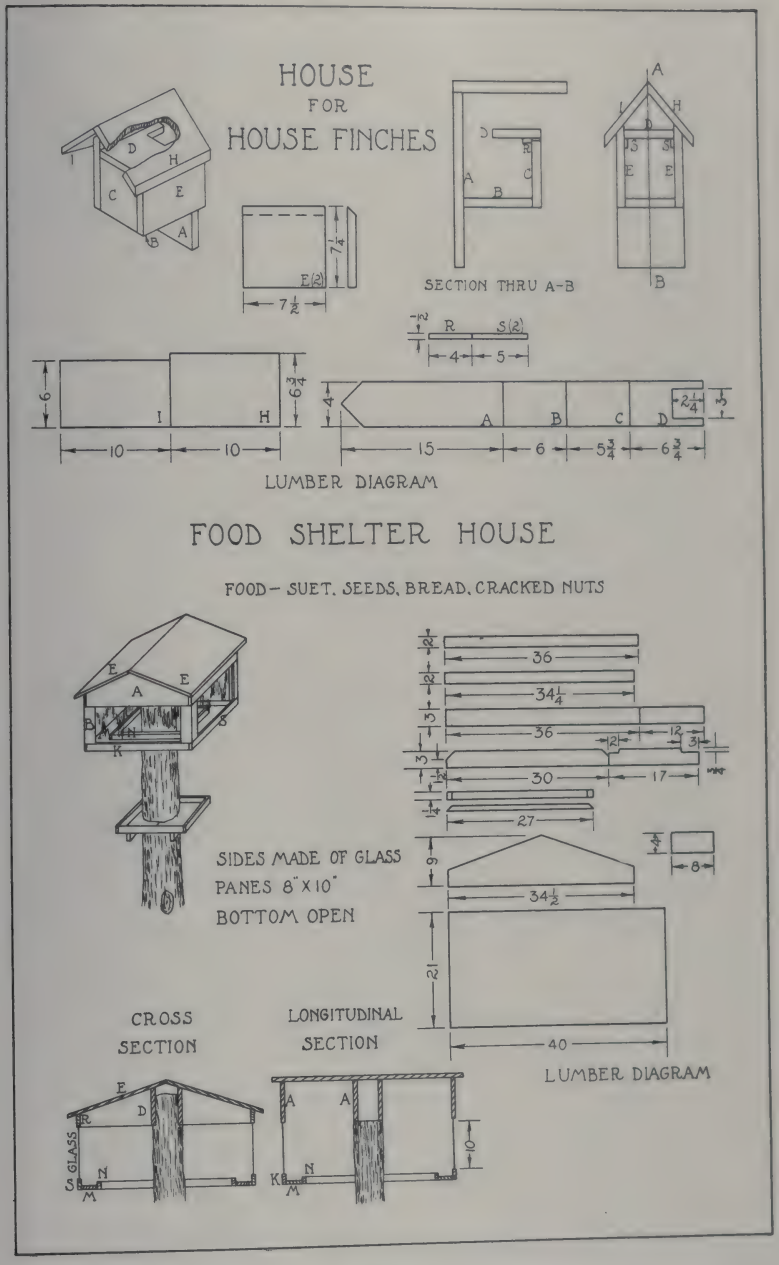

HOUSE
FOR
HOUSE FINCHES
SECTION THRU A-B
LUMBER DIAGRAM
FOOD SHELTER HOUSE
FOOD – SUET, SEEDS, BREAD, CRACKED NUTS
SIDES MADE OF GLASS
PANES 8" X 10"
BOTTOM OPEN
CROSS SECTION
LONGITUDINAL SECTION
LUMBER DIAGRAM

FIG. 11.

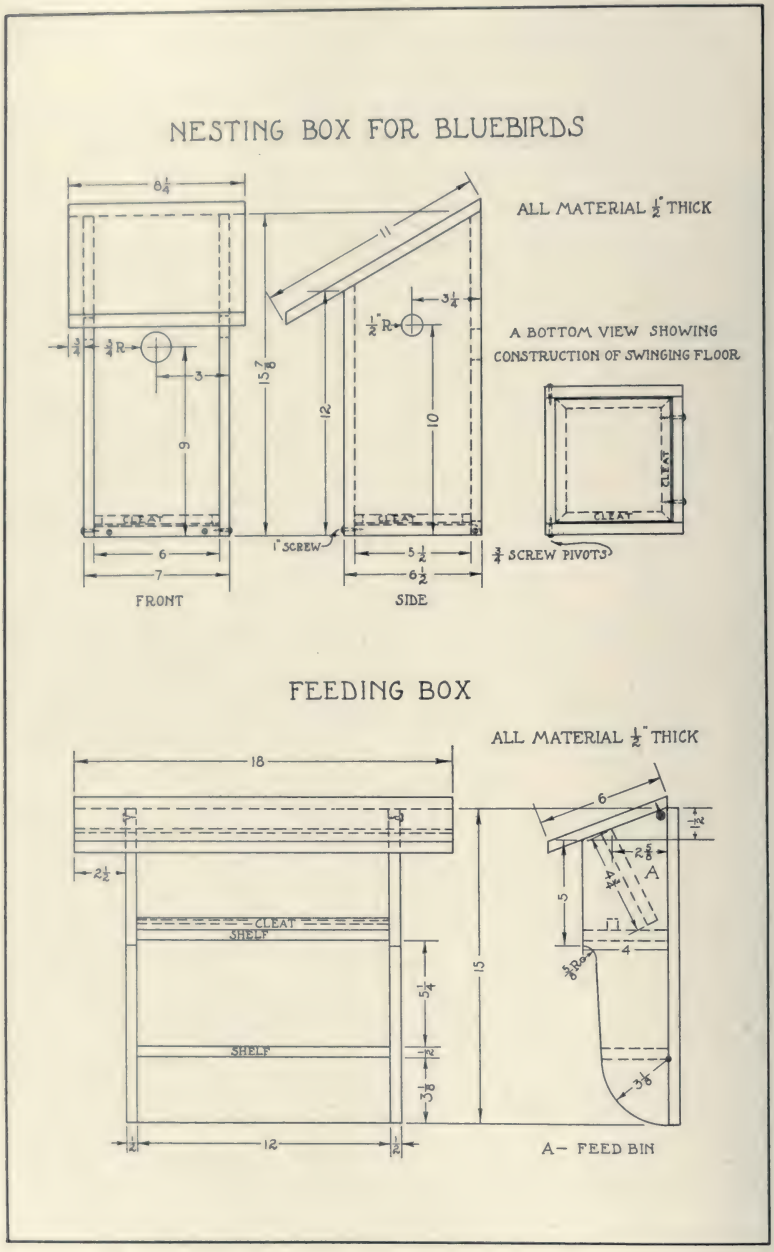

NESTING BOX FOR BLUEBIRDS
ALL MATERIAL ½" THICK
A BOTTOM VIEW SHOWING CONSTRUCTION OF SWINGING FLOOR
CLEAT
1" SCREW
¾ SCREW PIVOTS
FRONT
SIDE
FEEDING BOX
ALL MATERIAL ½" THICK
CLEAT
SHELF
SHELF
A– FEED BIN

FIG. 12.

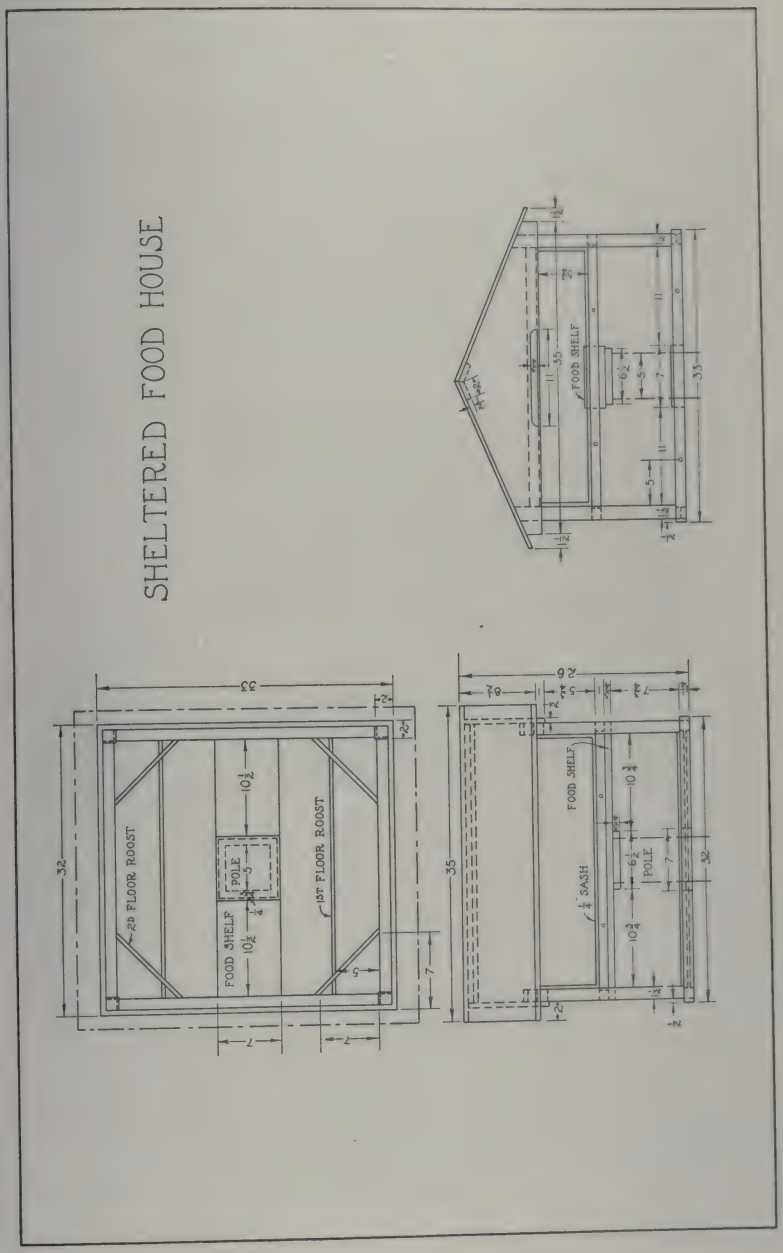

SHELTERED FOOD HOUSE
2d FLOOR ROOST
1st FLOOR ROOST
FOOD SHELF
POLE
SASH
33
32
35

FIG. 13.

MILTON, MASS.

Figs. 12 and 13 were made from bird houses designed by the contributor. Fig. 12 shows a nesting box for the bluebird, and a feeding box. The bottom of the bluebird house is held in place by four screws so arranged that when two are removed the bottom turns on the remaining two, thus affording a means of cleaning. The cover of the feeding box is hinged to the box by two screws passing thru screw-eyes in the cover placed just far enough apart to go outside the box.

Fig. 13 gives a sheltered food house with several interesting features.

ST. JOHNSBURY, VT.

The success of the boys in bird house building has, in a large measure, been due to the use made of the local museum and the help given by the

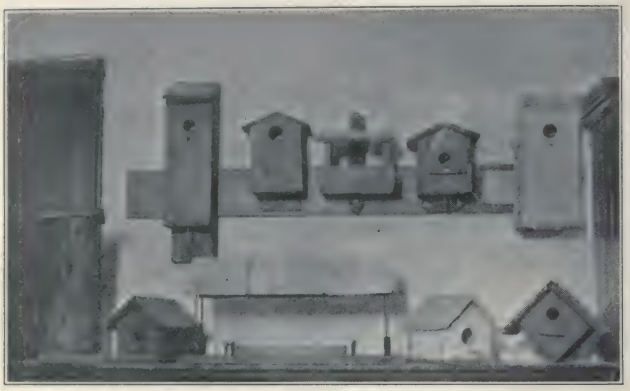


FIG. 14. HOUSES BUILT BY STUDENTS AT ST. JOHNSBURY, VT.

director. The habits, haunts, and general characteristics of birds are made familiar to the boys, after which they plan and construct homes for the birds common to that vicinity, with greater assurance and success in attracting birds. Fig. 14 gives a view of some of the resulting houses while Fig. 17 shows three typical plans. The floor of the bluebird house is held in place by two pieces of dowel rod which are removed when the house is to be cleaned.

CLEVELAND, OHIO.

The City Bird Lovers Association desired bird houses for the city parks. Several boys and girls at the East Technical School made and sold about 350 of the types illustrated in Figs. 15 and 16. The latter shows a student with a piece of ½″ x 4⅝″ x 53″ mill planed stock marked and ready to be cut into pieces which will assemble into a house similar to the completed one on the bench in front of the student.



FIG. 15. ALMOST READY.



FIG. 16. ECONOMY OF TIME AND MATERIAL WHEN LAID OUT IN THIS MANNER.

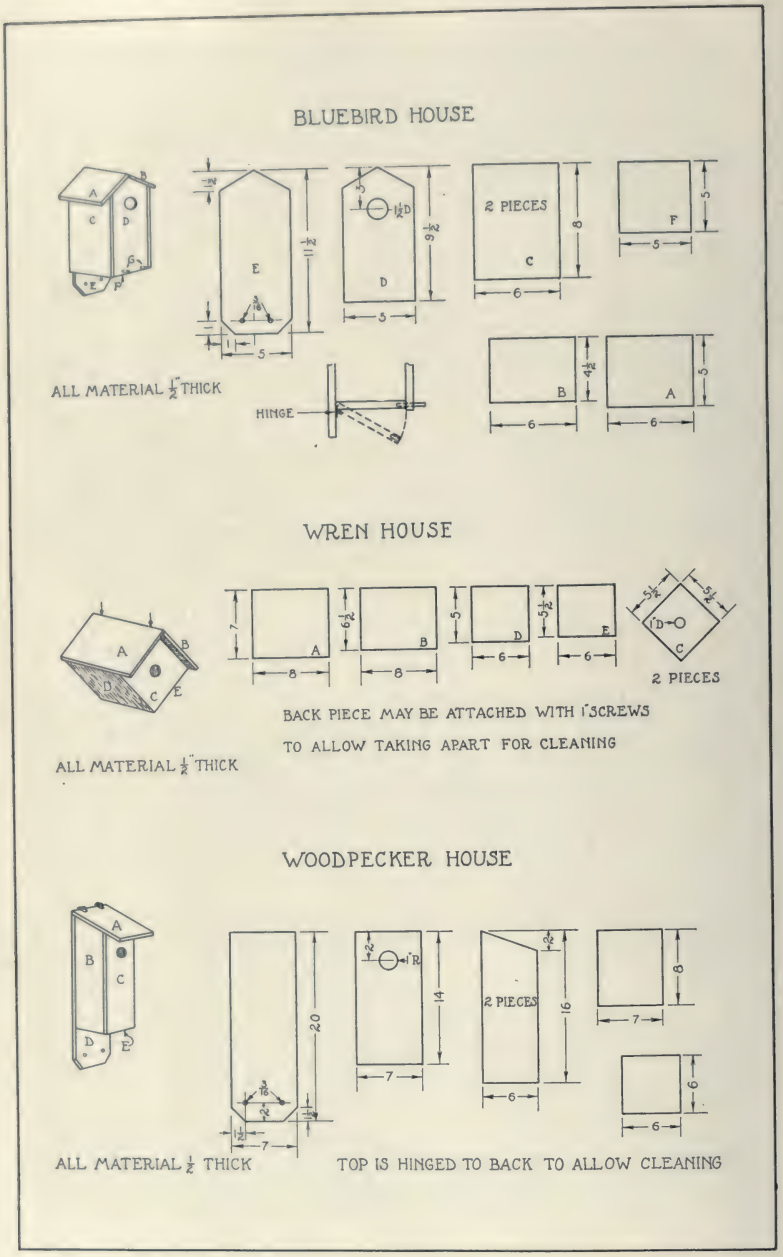

BLUEBIRD HOUSE
2 PIECES
ALL MATERIAL ½" THICK
HINGE
WREN HOUSE
2 PIECES
BACK PIECE MAY BE ATTACHED WITH ½" SCREWS
TO ALLOW TAKING APART FOR CLEANING
ALL MATERIAL ½" THICK
WOODPECKER HOUSE
2 PIECES
ALL MATERIAL ½" THICK
TOP IS HINGED TO BACK TO ALLOW CLEANING

FIG. 17.

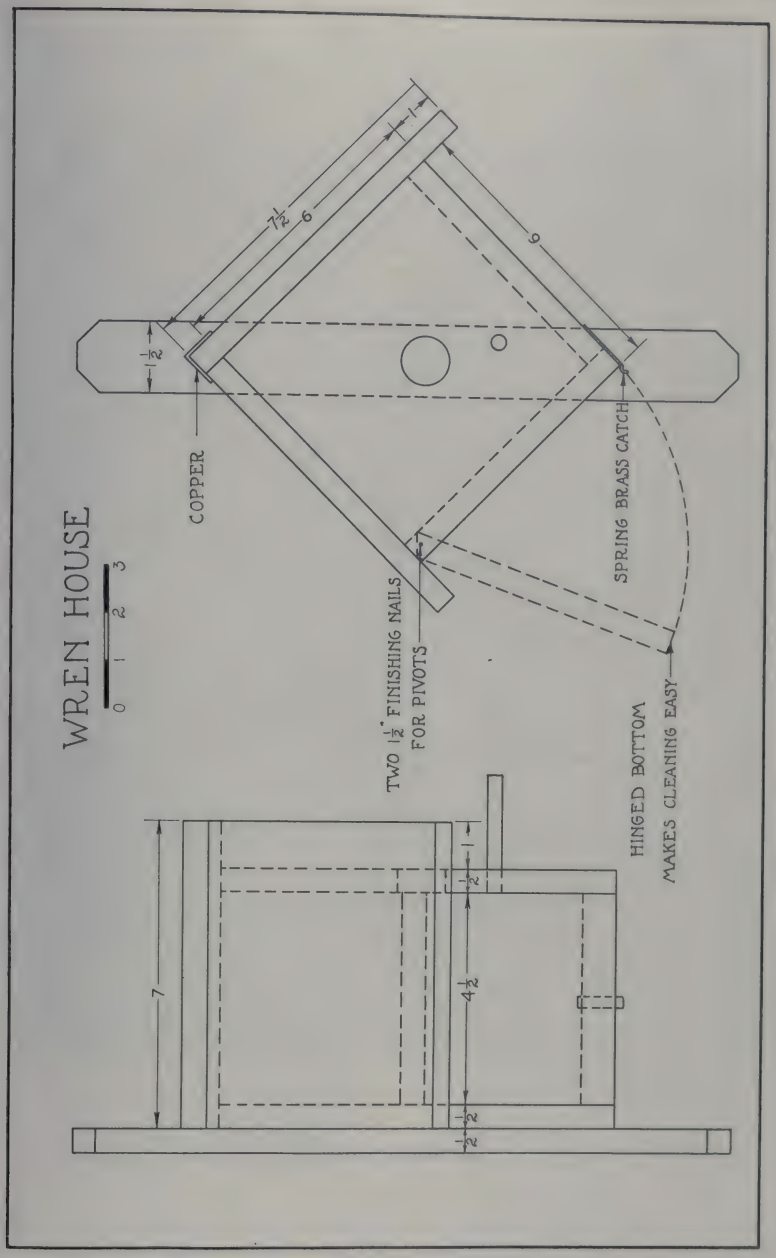

WREN HOUSE
0 1 2 3
COPPER
TWO 1½" FINISHING NAILS FOR PIVOTS
SPRING BRASS CATCH
HINGED BOTTOM MAKES CLEANING EASY
7½
6
9
1½
7
4½
1
½

FIG. 18.

BALTIMORE, MD.

A well worked-out plan for a wren house is given in Fig. 18. This project has been successfully made by pupils in the fourth grade.



FIG. 19. SIMPLE LOG AND BIRCHBARK CONSTRUCTION.

ST. CLOUD, MINN.

Fig. 19 gives good examples of log house construction, as well as the common type of house covered with birchbark, and a simple type of food shelter. Fig. 20 illustrates the small bird house and some of the possibilities of birchbark.



FIG. 20.



FIG. 21.



FIG. 22.

GOOD TYPES OF SMALL HOUSES.

SEATTLE, WASH.

The boys of the Mercer Industrial Center needed baseball suits for their team and had to meet the problem of how to raise the money. One of the boys proposed selling some of the bird houses they had made, but instead of selling them from door to door the plan was suggested that perhaps a local department store might sell Seattle-built houses in preference to those made elsewhere. The department buyer rather hesitatingly ordered a half-dozen to be delivered the next morning. Two houses were sold before the boys left the store and that evening came a telephone order for a dozen more. This was only a beginning for the boys delivered ten dozen houses in the next three weeks for which they received over fifty dollars.

These houses were built as "community problems," the eighth grade boys getting out the framework using the machinery with which the Center is equipped, while the seventh grade boys decorated these frames with willow twigs and bark as shown in Figs. 21, 22, and 23. The houses were designed in accordance with the suggestions given in this Magazine a year ago and the framework for houses for different birds was gotten out in one-dozen lots. The finished houses did not look alike because of the different ideas of the various boys who decorated them.



FIG. 23. A QUAINT BIRD HOME.

For this year the boys plan a larger selling campaign, and to make feeding boxes and fountains as well as nesting boxes. The goal set is to earn enough money to equip the school with a first-class printing outfit.

The boys have come to realize the value of community work and the division of labor in the making of these houses. They experienced the satisfaction of making something which had a commercial value and for which there was a demand. They saw the value of making a thing attractive because their houses sold while others did not, and, best of all, they developed an interest in the bird life of the community which cannot but serve the best interest of all concerned.

REVIEWS

Prevocational Education in the Public Schools, by Frank M. Leavitt and Edith Brown. Houghton Mifflin Company, Boston, 1915. 5 x 7¼ inches; 245 pages; price, $1.25.

This book explains the nature and purpose of prevocational education; it shows that prevocational instruction is a natural development of the school system, whereas some forms of vocational education are a forced development or entirely separate; it calls attention to density of population as a factor of great importance in determining the character of vocational instruction, and thereby emphasizes the fact that vocational education is largely a local question; it makes clear the fact that all education is both vocational and cultural and that the name given to a particular scheme or school merely denotes where the emphasis is placed. Also the book tells how to inaugurate prevocational classes, how to equip the workshops, and how to outline the courses of instruction in physiology and hygiene, history, science, English, mathematics, drawing, and shopwork. Many of the practical suggestions have come from the prevocational school experience of Professor Leavitt at the University of Chicago and in the public schools of the City of Boston, and from similar experiences of Miss Brown in the Lane Technical High School of Chicago. However, the authors have drawn freely from the work of successful schools in several other cities.

The book discusses some of the most vital probelms before American educators at the present time, and it deserves to be widely read and used as a handbook of practical suggestions by teachers who have to do with boys of the 14- to 16-year-old period. It answers hundreds of questions that are constantly being asked about this new phase of school work.

Experiments in Industrial Organization, by Edward Cadbury. Longmans, Green & Co., New York. 5 x 7½ inches; 296 pages; price, $1.60.

To those who think social welfare work, as exemplified in some of our American business institutions, is a development of the last decade, this book will be quite illuminating. The present volume is an English publication giving an account of the organization of a large factory known as the Bournville Works and located four miles southwest of Birmingham, England. More than fifty years ago two brothers, George Cadbury and Richard Cadbury conceived the ideals which have made possible the development of the experiments described, and the son of George Cadbury has recorded them in this book. The chapter headings are as follows: I The Selection of Employees. II Education of Employees; III Discipline; IV Provisions for Health and Safety; V Methods of Remuneration; VI Organization; VII Recreative and Social Institutions; VIII Industrial Conditions; IX Conclusions.

The whole subject is treated in a broadly sympathetic manner with the interests of all concerned in view. The development of the workers as individuals and citizens is kept well in mind. The author says, "It is taken for granted that before any so-called scheme of welfare work can be of lasting good, a living wage must be paid, and hours of labor and hygienic conditions

must not involve the deterioration of the workers. It must be quite evident that clubs and classes, savings funds and libraries, are quite thrown away upon workers who are overworked and underfed." Special emphasis is given to the fact that the success of welfare work is determined by the spirit that prompts it. The self-respect of the workers is preserved in all the firm's relationships with them. To quote: "The test of any scheme of factory organization is the extent to which it creates and fosters the atmosphere and spirit of cooperation and good-will without in any sense lessening the loyalty of the worker to his own class and its organization." It is patent to all who have had experience along these lines that to accomplish this calls for large vision.

The methods employed in the Bournville Works are not Utopian; neither does the author claim an exhaustive treatment of the subject. The book is modestly offered as a contribution to the science of industrial organization, which as yet is almost in its infancy.

Commercial Education in Public Secondary Schools, by F. V. Thompson, Assistant Superintendent of Public Schools, Boston, Mass. World Book Company, Yonkers-on-Hudson, New York. 5 x 7½ inches; 194 pages; price, $1.50.

This is a volume in the School Efficiency Series, edited by Prof. Paul H. Hanus, of Harvard University. The author makes a critical examination of contemporary commercial education, distinguishing clearly between mere clerical training and real education for business. He offers constructive proposals based on the actual needs of business as it is today. His plan would lead to effective cooperation between business and commercial education, with the object of making the latter truly vocational. The author's experience qualifies him to speak with authority on this subject. The book is timely in point of view and in subject-matter.

Arithmetic for Carpenters and Builders, by R. Burdette Dale, Director of Vocational Courses, Iowa State College, Ames, Iowa. John Wiley & Sons, New York, 1915. 5¾ x 7 inches; 231 pages; price, $1.25.

This is a practical book and should appeal to practical people. The author discusses and, with the aid of many figures, shows where arithmetic is essential to successful carpentry, how it is applied, and under the various divisions lays before the student many practical problems to work out.

The first six chapters could be successfully adopted for use in any eighth grade. Practical applications are made of such fundamentals of arithmetic as are taught up to and including the eighth grade. A valuable chapter on rules for belts, pulleys, board measure, and problems of like nature appears. The business side of carpentry and building is not forgotten, and it is thoroly dealt with.

Several chapters are devoted to the application of elementary algebra, geometry, and physics to carpentry. The correct proportions in concrete mixtures; the areas of walls and roofs; and the volumes of buildings and bins are a few of the subjects which are treated. The carpenter's square is fully explained, with the many uses to which the scales and measures may be put. Then follow many excellent problems in which that tool is used. Some of these problems are: floor bridging, stair beams, roof pitches, and common hip, valley, jack, and cripple rafters.

The book is well graded from the simple to the complex in its treatment of the subject. The first part could be used to a good advantage in prevocational school work; the latter and greater portion in vocational, continuation, and evening school work. It should also prove valuable to the carpenter "on the job."

Farm Shop Work, by George M. Brace and D. D. Mayne. American Book Company, New York, 1915. 5 x 7¼ inches; 291 pages; 251 illustrations.

For many teachers of the manual arts this book will fill a long-felt want. It presents work in the practical arts especially adaptable to rural, consolidated, and agricultural high schools.

The problems presented demand more of the rough, practical carpentry than fine furniture making. Added to the woodwork the authors also present practical work in metal, leather, and concrete. In the present day every successful farmer must have a working knowledge concerning these materials.

The book is first of all a textbook for schools, but at the same time, it presents a varied, useful list of problems for the farm. The processes and tools used in the working of these materials are introduced in a sequential order in much the same manner as in the manual training courses in the city schools.

The Basketry Book. By Mary Miles Blanchard. Charles Scribners Sons, New York. 5½x8½ inches; 111 pages; price, $2.00.

Books on this interesting ancient handicraft continue to come from the press. The present volume is devoted to the weaving of reed baskets, including work-baskets, flower baskets, scrap baskets, and carrying baskets. The necessary tools are listed and illustrated, and the various weaves are fully explained and illustrated. The dimensions of each basket and the amount of material required are also given.

As a book of instructions nothing has been omitted. The processes are so fully described that the earnest worker will find his efforts well rewarded. However, he must be persevering, accurate, neat, and capable of making his hand obey his mind. 'Tis no mean accomplishment to be a craftsman in basketry.

Progressive Exercises in Typography. By Ralph A. Loomis. The Taylor Holden Company, Springfield, Mass. 6½x9 inches; 80 pages; price, $1.00.

The rapid development of printing in manual arts courses has called forth several textbooks for class use. The content of this book is based on the needs of the beginner in printing. It is a course of practical, progressive exercises illustrated with many excellent examples of type composition, some in two colors, suggesting the most approved styles and methods in typography. The text matter is so arranged that it may be followed in detail as a course in printing, or it may be used as a reference book.

Following the rules for composition are exercises in printing which lead consecutively from straight composition thru increasingly more difficult work embodying the common operations of the composing room of any print shop. The exercises include personal, business and professional cards, tickets, letterheads, envelope corners, billheads, programs, menus, cover pages, posters, tabular and rule composition, and imposition. A valuable feature of the book is the questions at the end. The necessary knowledge of arithmetic as it applies to printing is well brought out by them.

RECEIVED

Exercises with Plants and Animals for Southern Rural Schools, by E. A. Miller, specialist in agricultural education. Bulletin No. 305, 1915, U. S. Department of Agriculture, Washington, D. C.

A Business Letter to the Corn Club Boys of West Virginia, a pamphlet by J. F. Marsh. Published by the Extension Department, College of Agriculture, West Virginia University. C. R. Titlow, Director, Morgantown, West Virginia.

A Metrical Tragedy, by Dr. Jos. V. Collins, reprint from *The Scientific Monthly,* December, 1915. Contains arguments for the adoption of the Metric System by the United States.

I Continuation Schools, II Training Classes for Teachers in Vocational Schools, reprint from the *Seventy-eighth Report of the Massachusetts Board of Education.* Bulletin No. 2, 1915, Boston, Mass.

Course of Study in Manual Training, by Frank H. Shepherd. Contains outlined courses in the industrial arts for boys in the high school grades. Also an outlined course of study in the manual arts, more cultural in nature, for boys and girls. College Bulletin No. 216, 1915, issued by the Extension Service, Oregon Agricultural College, Corvallis, Ore.

Machine Industry. Woodworking Industry. Clothing Industry for Girls. Collar Factories, compiled by Raymond C. Keople, Department of Vocational Education, from the survey made by the Rochester Chamber of Commerce. Bulletins Nos. 1, 2, 3, 4, 1915.

Saving Fuel in Heating a House, by L. P. Breckenridge and S. B. Flagg. Technical Paper 97, 1915, Department of the Interior, Bureau of Mines, Washington, D. C.

Course of Study in Industrial Training in the Elementary Schools, 1914-1915, published by School District No. 1, Portland, Ore.

Mathemetics in the Lower and Middle Commercial and Industrial Schools of Various Countries Represented in the International Commission on the Teaching of Mathematics, by E. A. Taylor, David Eugene Smith, William F. Osgood, and J. W. A. Young, members of the Commission from the United States. Bulletin No. 35, 1915, U. S. Bureau of Education, Washington, D. C.

Outlines for High School Agriculture, prepared by Iowa State College at Ames. Issued by the Department of Public Instruction, Des Moines, Iowa, 1915.

The Possibility of Vocational Training in Paper Box Making, Department Store Work, and Candy Making. The Wage Value of Vocational Training, reprint of *Appendix VI* of the *Fourth Report of the New York State Factory Investigating Commission,* Albany, N. Y.

Art of Keeping in Good Health, by Emil Wilk. Concordia Publishing House, St. Louis, Mo. Price 25 cents. Booklet of helpful suggestions for keeping the body in sound physical condition.

MANUAL TRAINING AND VOCATIONAL EDUCATION

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FOREWORD

THE most notable educational event of the past month was the Pan-American Congress held in Washington. Many eminent statesmen, scientists, and educators came from all parts of the Western Hemisphere. We are glad to present to our readers as the initial article in this issue the address by *John Dewey*, which was one of the strong addresses of the Congress. It had to do with Professor Dewey's favorite theme, democracy.

The article by *Ira S. Griffith* on "Individual Differences and How to Provide for These in the Manual Arts" is substantially the address given before the Conference of Manual Arts Teachers at the Chicago Normal College, December 9th to 11th. This address was one of the leading features of the conference, and we are glad to be able to present it in full, together with the charts which show in graphic form the results of tests for speed and accuracy in shopwork.

In the third article *Arthur B. Babbitt* of Wentworth Institute, Boston, and author of a valuable book on elementary mechanical drawing, discusses the function of the drafting department of a trade school, and its relation to all the other departments. He very properly insists that the teacher of drafting should have had practical experience before becoming a teacher of that subject.

In the fourth article *M. W. Murray*, principal of the Vocational High School, Newton, Mass., and *F. P. Dunbrack* of the same school, show how economy and efficiency may be served in teaching the processes of the machine shop by beginning classes with an equipment based on a small bench lathe instead of a far more expensive engine lathe.

The article on "Cane Weaving," by *L. Day Perry*, supervisor of manual training in Joliet, Ill., comes from a man who has had rather remarkable success in teaching caning and other seating processes to grammar grade boys. This article will be followed by one showing the application of the caning process as here described to the reseating of a chair.

The short article on the making of an electric motor is by *A. A. Weinstein* of Public School No. 2, New York City.

In this number, *William E. Roberts* begins a series of short articles on the reports of the Cleveland Survey.

In all probability a large proportion of readers will think of this issue as the "bird house number" owing to the extremely interesting results of the bird house competition reported in the "Shop Notes and Problems" department.

This Magazine is kept for sale at McClurg's in Chicago, and Brentano's in New York.

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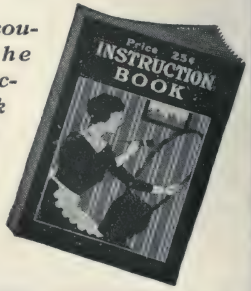
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FIELD NOTES

THE movement to devote a couple of weeks preceding Christmas to the making and mending of toys for distribution among the less fortunate is growing with both pupils and teachers of manual training. In the Webster Grammar School, Cambridge, Mass., the prevocational class, numbering 35 boys, devoted their efforts this year to making toys for the little folks in the kindergarten. In Denver, Col., the shops in the manual training high school served as first aid to Santa Claus. Gay-colored toys perched on every bench and shelf in the shops, some of which would do credit to any importer's stock. In Oklahoma City, Okla., the boys in the high school made or mended hundreds of toys, and the girls dressed and made presentable three hundred dolls.

BOOKER T. WASHINGTON'S SUCCESSOR.

A special committee of the trustees of Tuskegee Institute, with Seth Low of New York as chairman, has unanimously chosen Robert Russa Moton, the well-known commandant of cadets at Hampton Institute, as successor to Booker T. Washington. Major Moton entered Hampton Institute in 1885, graduating in 1890, and has been associated with the Institute ever since. In 1908 he became the secretary of the Negro Rural School Fund Board. Since 1912 he has served as president of the Negro Organization Society of Virginia, which works thru several hundred negro organizations for better schools, better health, better farms, and better homes. This society touches the lives of at least 350,000 negroes in Virginia. Major Moton is also a trustee of several negro institutes.

Having been a life-long friend of Dr. Washington and having known so well the high motives which characterized his whole life, Major Moton will no doubt prove a worthy successor to the "Moses of the Negro race."

SUPERINTENDENTS' MEETING AT DETROIT.

The outline of the plans for the coming meeting of the Department of Superintendence, to be held in Detroit, February 21st to 26th, points to an unusually interesting meeting. Almost every important phase of educational endeavor will be represented on the program, with special emphasis upon some of the newer problems.

For some time the problem of rural education has been pressing for solution, and one of the addresses which is being looked forward to especially will be given by Dr. P. P. Claxton, United States Commissioner of Education, on "A National Educational Campaign in Rural Communities." Another address in this same field will be given by G. C. Creelman, of Guelph, Ontario, on "Improving Rural Schools." In addition, the following subjects will be discussed: "Course of Study Content for Rural Schools," by H. W. Foght, Division of Rural Education, U. S. Bureau of Education; "The Work of the General Education Board in Rural Education," by Abraham Flexner, secretary. "Training Teachers for the Rural Schools of the United States" will be discussed under the following subdivisions: "In Normal Schools, Colleges, and Universities; "In Summer Schools and Institutes;" "In High Schools;" "By Means of Reading and Correspondence Courses;" "By Legal Enactments;" "Thru Field Supervision."

The junior high school idea has been growing quite rapidly in this country, especially in some of our larger cities. In view of this a debate on "The Junior High School—Pro and Con" led by Dr. Charles H. Judd, University of Chicago, and Dr. Carroll G. Pearse, President, State Normal School, Milwaukee, will be a timely discussion. Another timely debate will discuss "The Differentiated *versus* the General Essentials Courses of Study for the Seventh and Eighth Grades." Dr. David Snedden, Commissioner of Education for the State of Masachusetts, and Dr. F. E. Spaulding, superintendent of schools in Minneapolis, will support one side of the question; Dr. L. D. Coffman, University of Minnesota, and Dr. C. W. Bagley, University of Illinois will take the opposing side.

One session will be known as "School Board Session," the speakers all being men of national reputation in school affairs. Another interesting event will be "Governors' Evening" at which Woodbridge N. Ferris, Governor of Michigan, Frank B. Willis, Governor of Ohio, and Martin

(*Continued on p. VI.*)

G. Brumbaugh, Governor of Pennsylvania, will deliver addresses. Many other addresses on various phases of educational problems will be given.

The usual number of associations meeting with the Department of Superintendence will hold sessions as provided in the program. The Vocational Guidance Association will hold its sessions in the morning and afternoon of February 22nd, and The American Home Economics Association will have meetings on Friday morning and afternoon, February 25th. Altogether, this meeting promises much to all who can attend.

COMMISSIONER CLAXTON'S REPORT.

The recent annual report of Dr. P. P. Claxton, Commissioner of Education, to Secretary of the Interior, Franklin K. Lane, is valuable to all who are interested in following the steps of educational progress in our country. It covers the work of the past year and describes quite fully the varied lines of activity carried on by this department of the Federal government. Among other things it has conducted an effective campaign for better rural schools and made important beginnings in industrial education and home-making. An additional appropriation from Congress has made it possible to establish a division of industrial education and home-making composed of one specialist in industrial education and two specialists in home economics. With this division it has been possible to do much of the preliminary work necessary in anticipation of the Federal aid for vocational education, provided for in the Smith-Hughes Bill and endorsed by President Wilson in his message to Congress.

The specialist in industrial education took part in the industrial survey of Richmond, Va., aided on request, the Commission of Vocational Education for the State of Washington, and participated in a number of national, state, and local conferences on industrial education, several of which were called on the initiative of the Bureau of Education. The specialists in home economics have cooperated with colleges of agriculture and normal schools in developing standards of education for home-making, in providing plans for the training of teachers of home economics in colleges, high schools, and elementary schools, and in preparing courses of study for State and local school authorities.

In connection with the Riverside Public Library, Riverside, Calif., there is held each year a summer school and winter school for training in library service. The courses cover six weeks in summer and eight weeks in winter. In addition to cataloging and classification, reference work and book selection, the subjects offered include library law, actual work in the bindery, documents, business methods and administration, work with schools and with young people, and many additional lectures from specialists. The work in library handicraft is an important part of the course and includes the making of book jackets, pamphlet cases, portfolios, sign writing, chalk drawing, and a demonstration of a book repair kit with the minimum equipment.

Miss Irene Warren, the librarian of the School of Education, University of Chicago, is one of the instructors for the present winter term.

A generous offer to new members is being made by the Eastern Arts Association (the new name of the Eastern Art and Manual Training Teachers Association). A copy of the "Proceedings" of the 1913 and 1914 meetings will be sent to each new applicant for membership as long as the present supply lasts. This 300 page volume is edited by Royal B. Farnum and is rich in material for supervisors and teachers of the manual and household arts. There are 50 professional papers. Among some of the topics discussed are: the aim of manual training; the function and terminology of manual training; the training of manual training teachers; industrial drawing in the elementary schools; teamwork between schoolmaster and layman; industrial art and the prevocational school; adaption of the manual training course to fit the community needs; prevocational schools for the motor-minded; unit courses; vocational courses; vocational training in the household arts, and vocational courses in the high schools.

Those who send $1.50 in dues to Fred P. Reagle of Montclair, New Jersey, will receive,

(*Continued on p. VIII.*)

"The printing trade is peculiarly rich in its associations. It 'underlies all learning.' Its influence can be made to function in all branches of academic training—language, reading, spelling, drawing, arithmetic, history, geography, science, etc. Shop activities in printing soon invade and transform these departments, and vivify and visualize them by substituting reality for bookishness."

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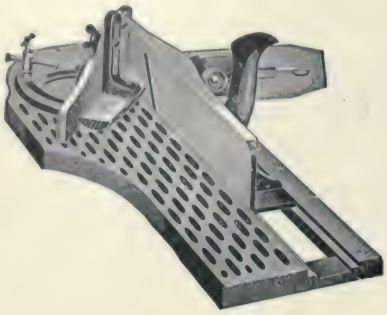
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FIELD NOTES.

(*Continued from p. VI.*)

besides this volume, the "Proceedings" of the 1915 meeting, equally rich in material. The next annual meeting of the Association will be held at Springfield, Mass., on April 20th, 21st, and 22nd, 1916.

At St. Johnsbury, Vt., the boys have been performing labor needed for the improvement of the school building and grounds. They have been setting up post and wire fence, painting the old board fence surrounding the school yard, putting in a concrete walk and steps, grading the playground, and building a tool room and lockers inside the school.

This is not a new idea in school work, though it is unusual. That it is not new will occur to readers of the life of Booker T. Washington, who on taking charge of Tuskegee Institute and finding that there was money for paying the teachers' salaries, but none for constructing needed buildings, secured donations of different kinds of building material, taught his pupils how to make brick, and by employing them as masons and carpenters erected serviceable quarters at the same time that he was conducting his young charges through their courses in manual training. "Learning by doing" is more than a pedagogical catch-word.

The enthusiasm that marked the opening of the evening trade extension classes at Dunwoody Institute, Minneapolis, is indicated by the fact that 800 students, all of whom were employed during the day, were registered for the first classes organized. After three months the evening school had 49 classes representing 24 lines of work, and an enrollment of over 1100 students. Plans have been made for the opening of dull-season classes during the months of January and February, which will cover plumbing, bricklaying, plastering, and painting. One part-time day class in baking chemistry is now in operation, and it is hoped that several more part-time day classes will be started before the close of the school year.

Frank L. Glynn, for the past two and one-half years director of the Boardman Apprentice Shops, New Haven, Conn., has been appointed assistant

(*Continued on p. X.*)

THE STOUT INSTITUTE

Summer Session 1916 -- -- July 31—September 1

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Organization of Manual Training.
Methods of Teaching Manual Training.
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Studies in Industrial Education.
Plumbing and Heating Theory.

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Gas Engine Design.
Architectural Drawing—El. and Adv.
Principles of Design.
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Pencil Sketching.

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Agricultural Forging.
Tool Smithing.
Art Smithing.
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Elementary Cabinet Making.
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Chair Construction.
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Carpentry Construction.
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Bricklaying.
Cement Work.
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Swimming for Men; for Women.
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Basket Ball and Track Work.
Public School Physical Training.

HOME ECONOMICS COURSES

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Art Needlework.
Millinery.
Dressmaking I, II.
Cutting and Fitting.
Costume Design.
Textiles.
Advanced Dressmaking.

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Food Study I, II.
Elementary Cooking I, II.
Advanced Cooking I, II.
Dietetics.

APPLIED ARTS.

Food Chemistry.
Chemistry of Nutrition.
Household Chemistry.
Microbiology.

OTHER COURSES.

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Household Management.
Home Nursing.
Home and Social Economics I, II, III.
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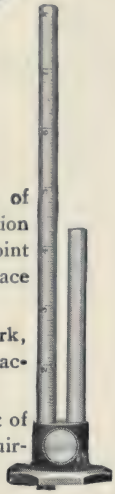
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(*Continued from p. VIII.*)

to the Wisconsin State Board of Industrial Education, his term beginning Jan. 1st, 1916. Mr. Glynn received his training in a private business college, the State Normal School in Oswego, N. Y., and in Cornell University, and has had practical experience in the machinists' trade and in business. His experience in school work includes the direction of manual training in Niagara Falls, N. Y., the vocational school in Albany, N. Y., and the State trade schools in New Britain and Bridgeport, Conn. In New Haven, Mr. Glynn developed an apprenticeship course, coordinating the city school system and local industries. The new position is expected to afford opportunity for further developments along this line in Wisconsin.

The Social Economics Club, of Milwaukee, Wis., recently submitted to the Board of Education a plan for organizing a vocational and placement bureau. To prevent children from leaving school for inadequate reasons, a bureau, such as the club advocates, would gather material for instructing children in school concerning industrial and business conditions, with emphasis on the economic value of education and the necessity of mental training as a background for practical work.

The United States Bureau of Education is making a study of the schools and the industries of Wilmington, Del., as a part of a State survey which has been undertaken at the request of the Delaware Cooperative Educational Association. The aim, as in previous surveys, will be to learn the essential facts and possibilities for industrial education in the schools and in the industries, the need for more industrial education, and then suggest a program of industrial school work.

In the East Union Street School, Springfield, Mass., the boys and girls have become quite enthusiastic over making a number game. The work calls for the use of the jig and it has been so well done that it is considered an excellent demonstration of the value of jig work. The work was divided up with groups just as it is done in a factory, the older boys doing the assembling and helping with the finishing.

(*Continued on p. XII.*)

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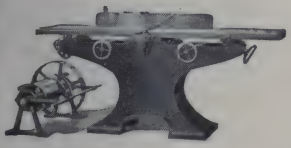
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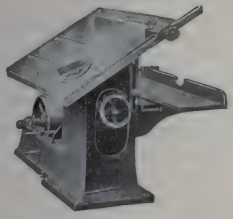
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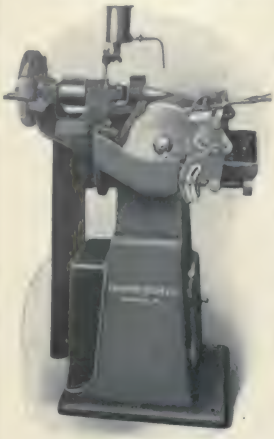
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FIELD NOTES.

(*Continued from p. X.*)

Professor M. B. King, director of the Pennsylvania State Bureau of Vocational Education, has announced that 74 school districts in the State have arranged to cooperate with the State under the new child labor law, which calls for the opening of 364 continuation schools. In addition, 25 mercantile establishments will conduct "store schools" and 16 factories will conduct similar schools.

A machine products exhibition was held in the vocational school at Springfield, Mass., which lasted for one week beginning on January 17. Practically all the machine shop manufacturers of Springfield sent exhibits covering hand tools, complete machines, machine parts and sectional parts of machines. The success of the printing products exhibition which was held last October has suggested the value of exhibits of this character.

In the recent annual report of Dr. George E. Vincent, president of the University of Minnesota, a consistently progressive policy in meeting the educational needs of the State was urged. He suggested further development of business courses and courses in specialized vocations comparable to professional training in law and medicine, including those fitting students to be librarians, social service workers, directors of physical education and teachers of manual training. Short courses for newspaper men and professional and occupational groups of many kinds are among the numerous suggestions outlined by Dr. Vincent.

In an address at the dedication of the new vocational building of the State Normal School, Terre Haute, Ind., Governor Woodbridge N. Harris, of Michigan, emphasized the need of fitting pupils for intelligent citizenship, urging attention to the industrial and vocational educaton of foreigners. He declared that the system of education developed should also take into consideration the public health, since ill health is the chief cause of crime.

Willingness to cooperate with the boys' and girls' clubs in the rural schools that wish to

(*Continued on p. XIV.*)

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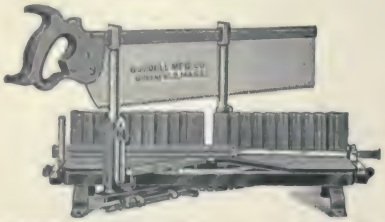
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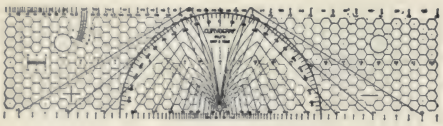
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FIELD NOTES.

(*Continued from p. XII.*)

secure a modest equipment for manual training has been assured by the county board of education in St. Louis County, Minn., according to an announcement made by N. A. Young, county superintendent of schools and clerk of the county board. A list of tools of excellent quality has been selected, and these, with a cabinet and bench, will be furnished to any school of the unorganized or county district that shows enough interest to raise $10 towards the cost. The cost to the county is $25.50 for each set. The county board of education will pay the remainder.

By the act of her latest legislature, Wisconsin has pushed the age of compulsory school attendance farther than any other state. Hereafter children between 16 and 17 not attending the regular public school will have to attend day continuation school for half a day a week, eight months of the year. This provision applies to all children, whether working or idle, in cities of more than 5,000 population. Change was made, also, in the provisions affecting those under 16. For the past three years children in employment were compelled to attend day continuation school a half a day a week for eight months a year. This has now been raised to ten months and applies henceforth to all, whether working or not, if they are not in attendance at the regular public schools. It is expected that these changes will raise the attendance at the day continuation schools of the State, now about 15,000, from 40 to 50 per cent.

In his second annual address Governor R. L. Beekman of Rhode Island urged the establishment of continuation schools for children who leave school for employment. They should receive part-time instruction adapted to their needs and related to their employment. He stated that altho 96 per cent of all the children in Rhode Island between seven and fourteen years of age attend school, only 63 per cent of those fourteen years old and 41 per cent of those fifteen years old are in school. The need to strengthen the system of public education was deemed imperative.

The course which is given without charge at the Brooklyn Evening Trade School, Seventh

(*Continued on p. XVIII.*)



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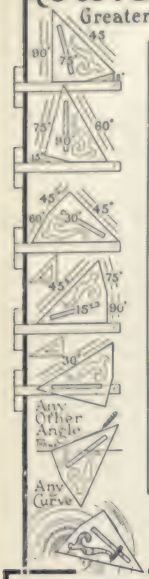
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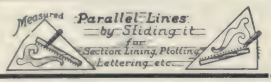
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FIELD NOTES.

(*Continued from p. XIV.*)

avenue and Fourth street, to those who are preparing to qualify for places with the city, state or federal government is under way. The subjects taught equip a man to become an inspector of grading and paving, of masonry, of buildings, of sewers, of iron and steel and other types of inspection for which the city has to hire men. Men in the building trade and graduates of high schools are especially qualified for the class. Only a grammar school education is necessary for admission to the class.

The annual meeting of the Eastern Arts Association, formerly the Eastern Art and Manual Training Teachers' Association, will be held in Springfield, Mass., on April 20th, 21st, and 22d, 1916. The exhibits and most of the meetings will be held in the "justly famous municipal group." The City Property Committee has given the entire use of the Auditorium, Exhibit Room, and Mahogany Room for the three days of the convention. Among the exhibits the Massachusetts system of State-aided vocational schools will be given special emphasis and the work of the Springfield schools will be shown in detail. Excursions to a number of industrial plants are planned, and to the United States Armory. Altogether, the meeting is to be the most valuable in the history of the Association.

The school committee of Quincy, Mass., has voted to establish a school for the teaching of home-making, the curriculum of which will include courses in dressmaking, cooking, nursing, household economics, and some academic instruction. It will be organized under the Industrial School Act, so that half the cost of maintenance may be obtained from the State. Similar schools have been established in Somerville, Cambridge, Newton, and Holyoke.

Charles B. Howe, head of the manual training department in Bushwick High School, Brooklyn, N. Y., is preparing an advanced physics course for the students. Like the industrial cooperative course which Mr. Howe inaugurated last year, this scheme is being established for the purpose of teaching those students who do not intend to enter an engineering college, the essentials of steam and electrical engineering. The construction of machines will be studied from a practical

(*Continued on p. XX.*)

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standpoint and the pupils will be taught to actually operate them.

An important ruling has just been made by the school authorities of Philadelphia which affects the students seeking admission to the Philadelphia trades schools, now a part of the public school system. These schools have been placed on the list of vocational schools and no pupil will be admitted to them hereafter who has not shown ability while in the grammar grades. It will be readily seen that with the elimination of those who often proved either misfits or defectives, the serious-minded students can progress much more rapidly than heretofore.

The Manhattan Trade School, the only free public trade school for girls in New York City, has had in the last year less than 14 per cent of American-born among its students. The Italian are 28.3 per cent, the Jewish 25 per cent, German 13 per cent, Bohemian 10.1 per cent, Irish 5.1 per cent. Approximately 71 per cent of the pupils are between fourteen and sixteen years old. Unless they are graduates of elementary schools, girls must be fourteen to be admitted.

The minimum requirements for admission to examination for teaching positions in the New York City vocational school are: Five years' successful experience as a journeyman wage-earner, or in a higher position, in the vocation in which the applicant seeks a license, together with one year's satisfactory service in teaching the same vocation.

Work in vocational guidance will be intensively taken up in the Boston schools from now until the close of school in June. At that time

(*Continued on p. XXI.*)

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TO TEACH efficiently a technical subject such as pattern-making, it is necessary to use the best teaching methods. Individual and classroom instruction without a textbook is not adequate. A satisfactory textbook must be technically correct; must present the best methods of instruction and those most easily understood by the students. It must also meet the usual requirements of organization, language, illustrations, binding, etc., so essential in a book for students' use.

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FIELD NOTES—(*Continued from p. XX.*)

many pupils will leave school to go to work, and they will need all the counsel available in entering the great world of industry.

The New York University has just announced courses in investment securities, railroad bonds, municipal bonds, industrial securities, and kindred subjects. In offering such courses the University takes a step in advance of any other institution of learning.

The old Emma Willard School in Troy, N. Y., is to be the home of a school for young women which will offer courses similar to Pratt Institute and Simmons College. Mrs. Russell Sage has appropriated $250,000 for the maintenance of the school and it will be known as the Russell Sage School of Practical Arts. Mrs. Sage's munificence recently made possible the erection of new buildings for the Emma Willard School, and this further gift will enable the trustees to utilize the old buildings also.

A test case carried up to the Supreme Court of the State of Washington recently decided that the law which had been passed making all employment agencies unlawful did not include teachers in its scope for the reason that teachers were not the "workers" which the law was intended to protect.

The Oregon Agricultural College, Corvallis, Ore., announces that Dr. William T. Bawden, specialist in industrial education, United States Bureau of Education, has been secured to deliver a series of lectures during their summer school. Dr. Bawden will spend two weeks at the College.

The cuts as well as the drawings for the illustrations used in *The Searchlight,* published by the students of the junior high school, Grand Rapids, Mich., are made by the students. Those made for their Christmas number deserve special commendation.

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Footstool (with padded top)
Knife-polishing box
Box
Flower table
Boat
Bench-hook
Drawing Board and T-square
Printing Frame
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BOOK NOTES

The fourth volume of the Cleveland Educational Survey monographs has just come to hand. It is on *Financing the Public Schools* and was written by Earle Clark, statistician for the Russell Sage Foundation.

The "Problems Series" of books published by the Manual Arts Press is undergoing a change of form. Originally they were published as loose-leaf books, but experience seems to have proven that they are more convenient as regular sewed books which will open out flat. For this reason the transformation is going on. *Problems in Wood-Turning* by Crawshaw, *Problems in Woodworking* by Murray, *Projects for Beginning Woodwork and Mechanical Drawing* by Griffith, and *Advanced Projects in Woodwork* by Griffith have recently appeared in the new form.

Problems in Farm Woodwork mentioned in this department in the January number appeared on the date announced, December 30th. The book is meeting with hearty approval. Most people are surprised that so many useful objects made of wood are needed in rural life. There are 99 in all. They are classified as follows: Shop Problems, 19; Poultry Problems, 9; Seed Corn Problems, 7; Yard Problems, 12; House Problems, 11; Garden Problems, 10; Stock Problems, 5; Barnyard Problems, 18; Bee Raising Problems, 3; Concrete Forms, 4; Other Problems, 1.

A TEXTBOOK ON PRACTICAL DRAFTING

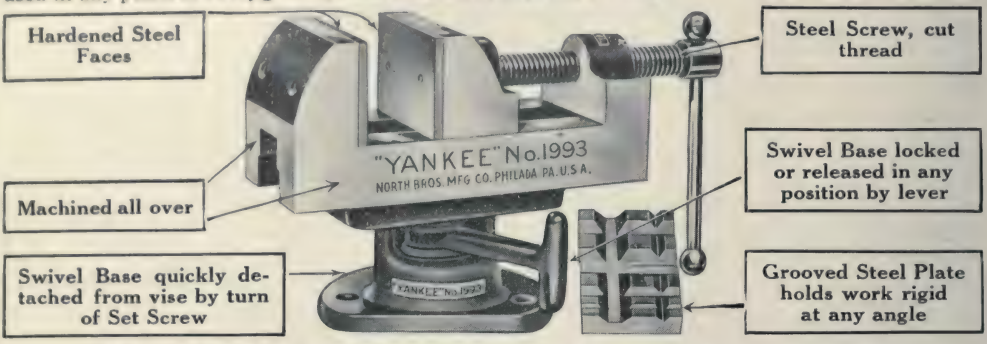
Mechanical Drafting, by Professor H. W. Miller of the University of Illinois, and published by the Manual Arts Press, has just been rewritten and reorganized to such an extent that it is a new book. All the good features of the original edition have been retained and many more added. The book has been revised by the author and the six assistants in his department. It therefore stands as the work of the Department of General Engineering Drawing of the University of Illinois. But that is not all. It is a successful effort to bring into the compass of a moderate-sized textbook the fundamental essentials of mechanical drafting, along with a great number of the little helpful details not usually found in books on the subject. More than any other book we have read, it consists of the best drafting-room practice boiled down into textbook form.

The general scope of the book is indicated by the chapter headings which are as follows: (1) Lettering, Freehand and Mechanical; (2) Use of Instruments; (3) Orthographic Projection; (4) Working Drawings; (5) Fasteners, Threads, Bolts and Nuts, etc.; (6) Shop Terms, Tools, Machines, etc.; (7) Isometric and Oblique Projection; (8) Machine Sketching; (9) Perspective; (10) Appendix. But even this list does not give an adequate idea of the contents of the book in its present form, because it includes under these chapter headings a great deal of material that is unusual for a textbook on drawing, yet material that is needed by the practical draftsman, and should be at hand for the use of the student who is really learning to become a draftsman. For example, in the appendix will be found information on blueprint papers, sensitizing paper, Vandyke solar paper, washing and fixing Vandykes, transparentizing Vandykes, etc. Zinc etching, wax engraving, and the half-tone processes are mentioned. Abbreviations and conventional representations are given. The standard symbols adopted by the National Contractors' Association and the American Institute of Architects are given, also the symbols used in electrical and automobile construction, in piping, and hydrographical and topographical drawing. Then there are useful tables, alphabets and styles of gummed letters. All these are in the appendix. But the most important facts about the book are those which relate to the main body of the text where each subject is treated in so direct and concrete a fashion, and so fully illustrated that a class can be successfully taught with this book even if all lectures by the teachers are omitted. It reduces the need of lecturing to a minimum. On the other hand it does not contain a course of problems, as such, and therefore is suited to the needs of teachers with varying ideas as to the particular problems that should be presented for solution.

Briefly stated this textbook is a remarkably comprehensive and convenient treatment of the practical things that a draftsman should know—must know in order to be a good draftsman.

The Vise of Greatest Usefulness

Every tool maker, machinist, electrician, and user of high grade tools will appreciate this new "YANKEE" Vise. The new Swivel Base holds vise securely in any position. The special grooved Steel Plate enables operator to hold small work securely at any angle. Machined all over—can be used in any position as a jig for special work on drill press, or shaper.



JAWS $2\frac{3}{4}$ inches wide, $1\frac{7}{8}$ inches deep, open $3\frac{1}{8}$ inches. BODY $7\frac{1}{4}$ inches long

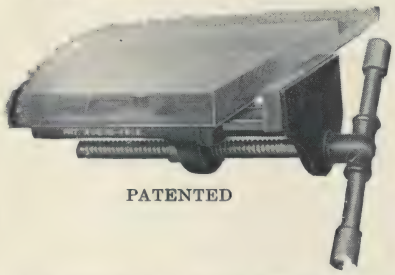
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Your Dealer can supply you *Mechanics and Householders—write for "'YANKEE' Tool Book." Automobilists—for "'YANKEE' Tools in the Garage"—both free.*

NORTH BROS. MFG. CO. OF PHILADELPHIA, PA.

"YANKEE" TOOLS *Make Better Mechanics*

THE BEMIS STANDARD VISE



PATENTED

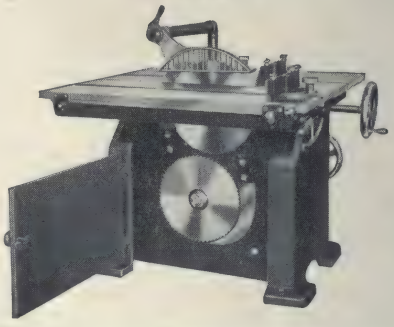
This vise has a novel self-aligning nut which is loosely held in a pocket on the plate supported by the fixed jaw. This feature is particularly covered by a patent of the United States, dated August 6, 1912. The user of an infringing device is liable for infringement equally with the manufacturer and seller. The public is hereby notified that the patentee will take all necessary steps to protect his rights.

Send for circular.

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72 Commercial St. Worcester, Mass.

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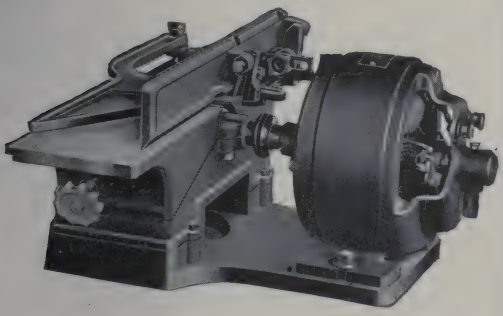
When you buy this machine you are not getting poor workmanship or skimped construction. You are getting the very best value that is made in this type of machine and we will gladly prove it to you by shipping one on 30 days' trial.

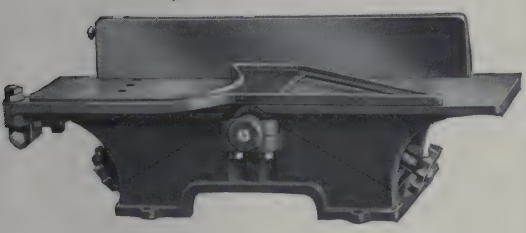
THE TANNEWITZ WORKS

GRAND RAPIDS, MICH.

TRADE NOTES.

Goodell-Pratt Company, Greenfield, Mass., issue a catalog of 1500 tools which they will gladly send to anyone interested in their entire line. In addition, they issue a small booklet of each of the important individual tools for the convenience of people who may wish to know only about certain tools. For instance, we have just received three booklets, one describing and illustrating their hack saws, another their bench grinders, and another their breast drills. They are well printed on high grade stock and invite reading.





Above are illustrations of the 4 in. Bench Jointer which has recently been put on the market by The Crescent Machine Company, Leetonia, Ohio. The machine is furnished with round safety head, tilting fence for bevel work, automatic guard, and has the rear table arranged for rabbeting. It is made either for belt drive or with motor attached direct. The belt-driven machine may be purchased either with or without the counter-shaft. It is a convenient machine for the individual woodworker. and being small size it is better adapted for small work than a large jointer. In addition, it can be placed where it is most convenient, either on the work bench or near it.

(*Continued on p. XXVI.*)

DISSTON

SAWS,
TOOLS,
FILES

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Enthusiasm,
Accurate Work
and
Rapid Progress
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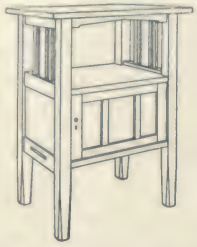
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Hotel Ponchartrain, Detroit.

NEW EDITION NEW BINDING

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FURNITURE MAKING
ADVANCED PROJECTS
IN WOODWORK

By IRA S. GRIFFITH
Professor of Manual Arts, University of Missouri.



A BOOK of problems for the use of high school pupils. It is essentially a collection of problems in furniture making selected and designed with reference to school use. It consists of 50 full-page plates and accompanying notes. On the plate with each working drawing is a good perspective sketch of the completed object. In draftsmanship and refinement of design these problems are of superior quality.

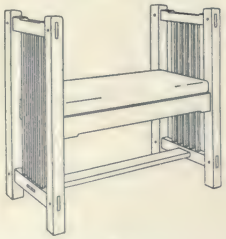
It is in every way an excellent collection and is sure to establish a high standard in any school where it is used with reasonable intelligence.

CONTENTS

Exercises — Keyed Tenon, Blind Mortise-and-Tenon
Exercises — Miter Joint, Glue Joint
Exercises—Modeling, Hammer Handles
Necktie Rack
Footstool
Book Rack
Upholstered Stool
Leg Rest
Cricket
Wall Shelves
Stool (Square)
Taboret (Octagonal Top)
Taboret (Round Top)
Small Table
Taborot (Square Top)
Piano Benches
Book Stand
Umbrella Stands
Jardiniere Stand
Magazine Stand
Roman Seat
Light Stand
Stool (Square)
Book Trough
Screen
Tea Table
Hall Rack
Wall China Rack
Side Chair
Arm Chair
Morris Chair
Electric Reading Lamp
Pedestal
Occasional Rocker
Mission Chair
Drop Leaf Table
Exercises — Mortise-and-Tenon Joint, Rabbeted Joint, Grooved Joint
Exercises — Thru Multiple Dovetail, Half-blind Dovetail
Waste Paper Box
Wall Cabinet
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Chafing-dish Stand
Cabinet
Library Table
Writing-desk
Dressing Table
Linen Chest

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THE MANUAL ARTS PRESS
PEORIA, ILLINOIS



TRADE NOTES.

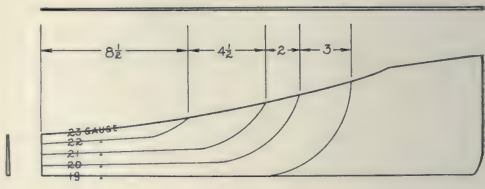
(*Continued from p. XXV.*)

The Dewey Blueprint Company announces that they have removed their stock and fixtures from their offices at Dallas, Texas and Manitowoc, Wis., and are now permanently located at 1155 Welton Street, Denver, Colo. With their enlarged equipment and increased facilities, they are now in a position to give manual training and industrial arts teachers better service than ever before. They are adding new departments as follows:—books for all of the public school arts; school magazines; blueprints for art teachers, including a new set of manual sketches; and a line of blueprint papers and drawing room supplies, especially for the Western trade. They will issue a new circular this month, describing all the above lines. A postal will bring it.

A HAND SAW CHART.

The boy is a young savage beginning to use tools. His mind must awaken and his hand acquire skill by repeating the historic operations. He should know the origin of the saw and the new demands laid upon it in modern mills and workshops.

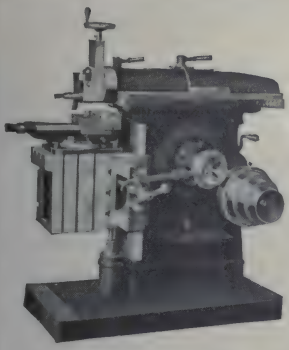
His next step is to learn how to judge a good saw. This means he must know how the saw is made. Saw-making has had a long development as well as saw using. Until the present it has been a hidden art. Now the Simonds Company, interested in practical education, and active in cooperating with the schools in Fitchburg, Mass., is preparing material to assist teachers and pupils in the knowledge and use of the saw.



TAPER GRINDING

This company has recently prepared a "hand saw chart" in the form of a blue print which they are glad to send to any teacher without charge. The accompanying illustration on taper grinding is taken from the chart. We suggest that teachers procure this chart, which is 18x24 inches, frame it, and hang it in their shops. It

(*Continued on p. XXVIII.*)



STEPTOE SHAPERS

are especially adapted to manual training school work and can be equipped with or without motor drive.

We can give you the names of a great many schools using our machines who will recommend them.

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are made with or without power feed to the table. They can be handled much quicker and easier than the larger machines and will cost about one-half or less. They will do small work quicker and are especially adapted for school room work.

Let us send you our catalogs.



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Northside - - - - - - Cincinnati, O.

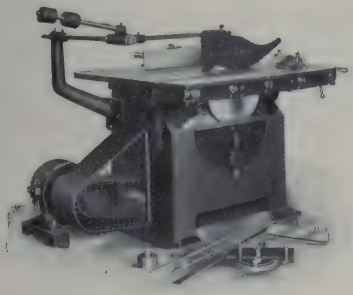
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AND BE SURE OF GOOD RESULTS——

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CATALOG 18

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GRAND RAPIDS, MICHIGAN

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Because they represent a greater investment in tool value at a smaller outlay of money.

Because they are tools worthy of your skill and ingenuity.

That's why it will safeguard your interest in demanding them by name.

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Illustrated Working Drawings of Type Models in Wood Working

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A set of 20 high school plates (not illustrated) ...30c
Single Plates (illustrated) each..... 2c
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A. P. LAUGHLIN, Pub.

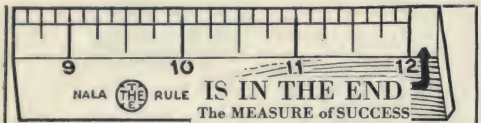
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That helps solve your Drawing Rule Problem
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SANI STEEL TABLES for DOMESTIC SCIENCE and BENCHES for MANUAL TRAINING
WRITE FOR CATALOGUE

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INDIANAPOLIS - - INDIANA

TEST SEED CORN IN SCHOOL

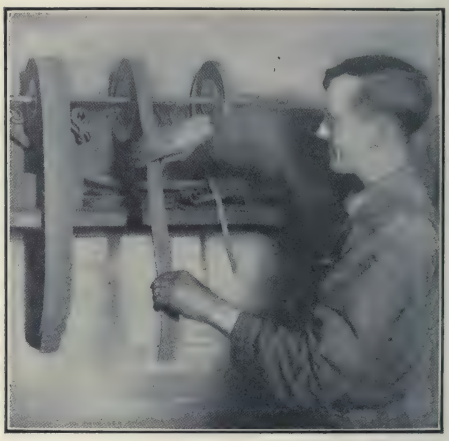
Work has high educational value—interests pupils and parents—increases corn yield—especially needed this year. Seed corn situation critical in Northern corn belt. Corn booklet, paper Rag Doll Tester, and one Corn Stencil sent free. Corn charts or slides furnished for express charges to and from Chicago. Address

Educational Department,
International Harvester Company of New Jersey, Chicago,

TRADE NOTES.

(*Continued from p. XXVI.*)

is a valuable help in teaching. The Company offers to furnish other teaching material without charge to those who will write to them stating their needs. The Company seeks not only to extend the use of its products but to make them serve a higher mission in educating hand workers. When you write send to the home office. Address Simonds Manufacturing Company, Fitchburg, Mass.



Those of our readers not familiar with "Aloxite" cloth, manufactured by The Carborundum Company, Niagara Falls, N. Y., will be interested in knowing about this material. It is used for polishing, and can be purchased in rolls of 50 yards in ½, ¾, 1, 1½, 2 and 2½ inch widths. The rolls are put up in any grit desired. Each roll is snugly wound on a metal spool. The above illustration shows convenient arrangement for its use. "Aloxite" cloth also comes in 9x11 inch sheets, rolls, and reams. With all these variations one can purchase according to their needs and without any waste whatever. Further information will be gladly furnished by the manufacturers.

Kindergarten, Manual Training and Vocational goods of all kinds.
Also Bradley's Water Color Paints, the best in the world.
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for specialists in Manual Training and Home Economics. If you desire a position, now or later, write us.

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Thomas Normal Training School

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Special One and Two-year Courses in Manual Training and Drawing. Also courses in Home Economics, Industrial Arts, Music, Physical Training, Penmanship. 25th year. Strong faculty, beautiful location. Fine equipment. Dormitory. Catalog.

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1916 CATALOG UPON REQUEST

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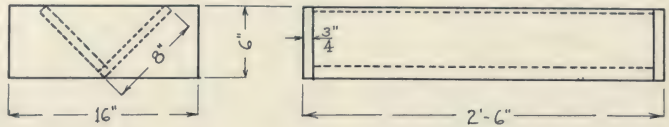
PREPAREDNESS IS THE WATCHWORD OF THE AMERICAN PEOPLE

Technical, Trade, Manual Training and Vocational Schools, Machinists and Apprentices are using the Text Book, ADVANCED MACHINE WORK, by Robert H. Smith.

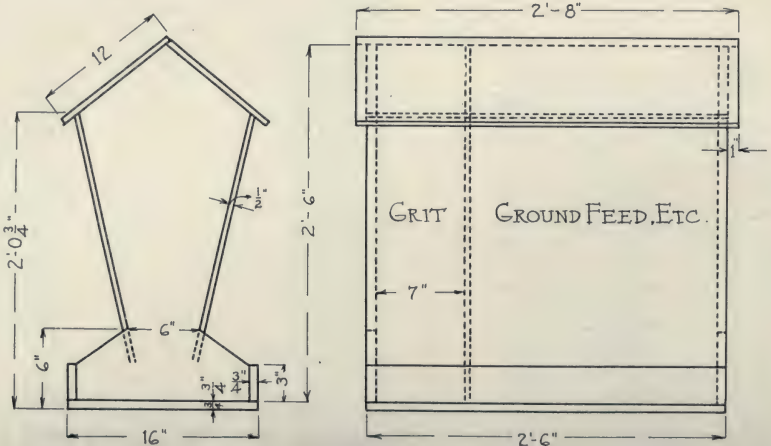
At the Massachusetts Institute of Technology the use of the text book ADVANCED MACHINE WORK has doubled the efficiency of the course and reduced the instructors' work one half. 575 Pages, 609 Engravings. Price $3.00

INDUSTRIAL EDUCATION BOOK CO., - Box 153, Back Bay, - BOSTON, MASS.

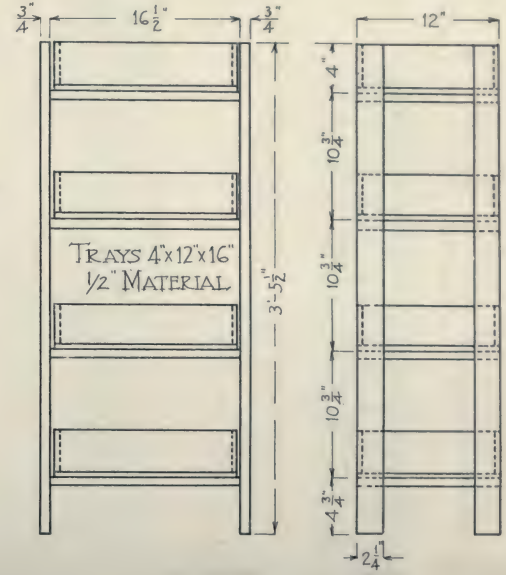
WATERING TROUGH



CHICKEN FEEDER



OAT'S SPROUTER



Sample page from "PROBLEMS IN FARM WOODWORK".
XXX
See description on the opposite page.

JUST PUBLISHED

100 NEW PRACTICAL PROBLEMS in Woodwork which relate to agriculture and farm life.

PROBLEMS IN FARM WOODWORK

is the first book to successfully present a collection of problems in woodwork of equal value to the teacher of manual arts and agriculture, and to the boy on the farm. It is especially valuable to the pupil or teacher of agriculture or manual arts in rural schools and in high schools in farming communities. The author, Mr. Samuel A. Blackburn of Dallas, Texas, was formerly teacher of woodworking, forging and mechanical drawing in the Agricultural High School at Spring Valley, Minnesota, and supervisor of the teaching of woodwork in the associated rural schools.

Accompanying each of the 60 full-page plates of working drawings is a page or more of text relating to the problem and treating of "Purpose," "Material," "Bill of Stock," "Tools," "Directions" and "Assembly." The book designates only the kind of material that may be bought from any lumber yard and hardware store and uses only the commercial sizes of lumber.

TABLE OF CONTENTS

I. SHOP PROBLEMS.
- Sack Holder.
- Nail Box.
- Tool Carriers (two types).
- Saw Horses (three types).
- Handles—
  - Hammer; Pick; Sledge; File; Vise.
- Drawing Board.
- Miter Box.
- Tool Chest (small).
- Tool Chest.
- Nail Cabinet.
- Screw Cabinet.
- Work Bench.

II. POULTRY PROBLEMS.
- Rows of Nests for Laying Hens.
- Nest for a Sitting Hen.
- A-shaped Coop for Hen and Chickens.
- Box Coop.
- Chicken Feeder.
- Watering Trough.
- Oats Sprouter.
- Chicken Crate.
- Egg Tester.

III. SEED CORN PROBLEMS.
- Seed Corn Testing Tray.
- Frame for Testing Tray.
- Corn Tray for Exhibition Purposes.
- Seed Corn Crate.
- Seed Corn Rack.
- Cabinet for Seeds and Small Grain.
- Seed Corn Sled.

IV. YARD PROBLEMS.
- Bird Houses—
  - Chickadee; Tree Swallow; House Wren; Martin House.
- Frame for Hammock.
- Gates.
- Farm Gates; Garden or Yard Gate (two types).
- A Flight of Steps.
- Sawbuck.
- Rabbit Trap.
- Porch Swing.
- Dog House.

V. HOUSE PROBLEMS.
- Bench.
- Bread Cutting Board.
- Swing Board.
- Fly Trap.
- Ironing Boards (two types).
- Door Screen.
- Window Screen.
- Kitchen Table.
- Kitchen Sink.
- Kitchen Cabinet.

VI. GARDEN PROBLEMS.
- Tomato Trellis.
- Trellis for Small Vine.
- Row Marker.
- Shrub Label.
- Transplanter.
- Step Ladder.
- Fruit Picking Ladder.
- Potato Marker.
- Garden Marker.
- Cold Frame.

VII. STOCK PROBLEMS.
- Hog Troughs.
- Grain Trough for Feeding Sheep.
- Feeding Trough for Stock.
- Unloading Chute.
- Individual Hog Cot.

VIII. BARN YARD PROBLEMS.
- Milking Stools (four types).
- Evener.
- Singletree.
- Neckyoke.
- Wagon Box.
- Wagon Box Details.
- Spring Seat.
- Wagon Jacks (two types).
- Sand Box.
- Hog Coop (to fit wagon box).
- Hay Frame.
- Pigeon House.
- Brush and Curry-comb Cabinet for Barn.
- Scales and a Convenient Case for Weighing and Sampling Milk.

IX. BEE RAISING PROBLEMS.
- Bee Hive.
- Bee Hive Details.
- Bee Hive for the Amateur.

X. CONCRETE FORMS.
- Concrete Mixing Box.
- Form for Concrete Post.
- Concrete Form for Silo Foundation.
- Details of Silo Form Construction.

XI. OTHER PROBLEMS.
- Mouse Proof Cage for Agricultural Exhibits.

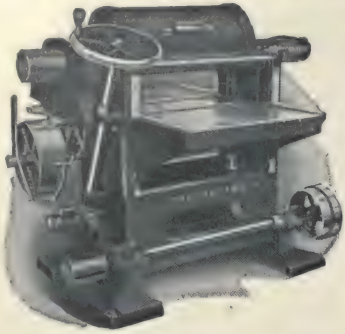
The drawings are clear, simple and complete and show a good standard of technique. See the sample page opposite this advertisement.

A WONDERFULLY PRACTICAL BOOK

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"The Porter" Single Surfacer



Made in 20" and 24" sizes. Well, safe guarded, a strong, well built machine that will do probably all and more work than you have and sells for from $160.00 and up.

We are willing to send you the machine on 30 days trial and if you are not convinced that it is a big bargain for the money, you may return it at our expense.

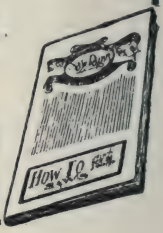
C. O. Porter Mach. Co.
Grand Rapids, Mich.



Free to Students

"Saw Points"

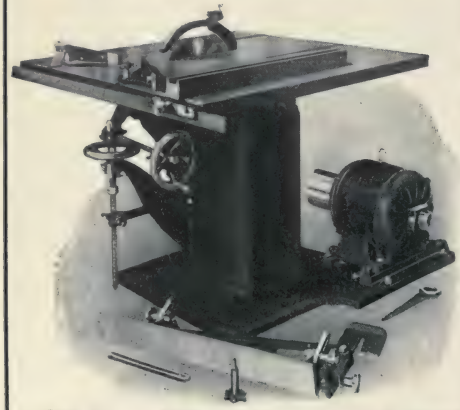
A booklet on how to sharpen and properly set Saws of all kinds. There is one *right* way to do this. Why not know how by reading this booklet. Write for FREE BOOKLET containing information valuable to all students.



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SAW TABLES



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Write us.

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NOBODY SEEMS HAPPIER

than the instructors of school printing offices who drop in to tell us of the wonderful results of their work in the school. They all relate similar experiences; boys (and girls) delighted with the work; begging to be allowed at the case; gaining knowledge that they can't forget; always on hand and wishing the hours of practice were longer; becoming accurate, well posted, enthusiastic American citizens. The print-shop in the school marks an epoch in scholarship, attendance, school spirit and Americanism.

We supply such offices and will give all interested the benefit of our experience and that of users. Estimates to suit the need and the purse of any school will be gladly furnished.

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FOR THE SUBSCRIBER:

We shall be glad to direct you to the manufacturer or dealer in anything connected with the manual and industrial arts, udon request for such information. Questions on organization, shop arrangement, texts and kindred subjects gladly answered to the best of our ability.

Address
THE MANUAL ARTS PRESS
SERVICE DEPARTMENT
PEORIA - - - ILLINOIS

AFTER HOURS

BURNING THE MISTLETOE.

A DAY or two before Christmas I received from a friend in the Southland a box full of the most beautiful sprays of mistletoe that I have ever seen. With their simple, enduring green leaves and their heavy clusters of the purest white berries they were a fine symbol of friendship, besides being a means of bringing Christmas good cheer. Most of the mistletoe was hung from the central light in the living room where it added to our pleasure thruout the holiday season.

The other evening when we were sitting before the open fire and a big log was burning, the suggestion was made that we would soon have to take down the mistletoe because it was losing its color, and the berries were drying up. So I cut the string and tossed the mistletoe into the fire on top of the log. It quickly caught fire and blazed up, making quite a display for the size of the bundle. As I threw it I was conscious of regret, but the memory of its brilliant ending was pleasanter than would have been the vision of its dried and shrivelled form.

If I were a preacher I suppose I would make this incident, and especially my decision to burn the mistletoe, the text for a twenty-minute sermon. Next to being a preacher is being a schoolmaster, so I may be allowed to suggest a moral for this tale: It might be well for teachers of the manual arts to give to some of their cherished 1915 methods of teaching the same heroic treatment that was given to the mistletoe. These methods may have served their purpose well in 1915; they gave us joy and satisfaction because they were our own, but some of them are already getting dusty and dried up and colorless; their beauty and vitality are gone. Better let the new year bring a fresh spray.

Why not burn the mistletoe?

CHOOSING MAKES THE ARTIST.

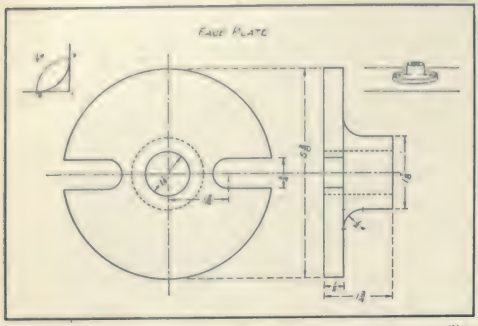
CHRISTMAS also brought me a copy of Gilbert K. Chesterton's "What's Wrong with the World" which has proven to be stimulating to my slow process of thinking. For example, here is a definition of art that caught my attention at once—not because it is new, but because of the way it is presented:—

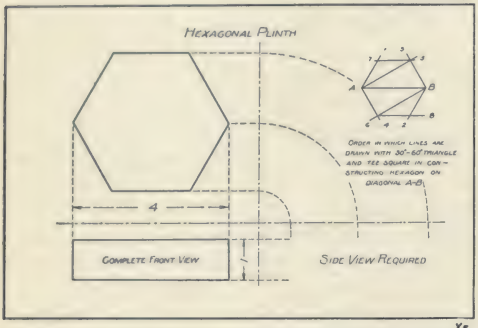
"God is that which can make something out of nothing. Man (it may truly be said) is that which can make something out of anything. In other words, while the joy of God be unlimited creation, the special joy of man is limited creation, the combination of creation with limits. Man's pleasure, therefore, is to possess conditions, but also to be partly possessed by them; to be half-controlled by the flute he plays or by the field he digs. The excitement is to get the utmost out of given conditions; the conditions will stretch, but not indefinitely. A man can write an immortal sonnet on an old envelope, or hack a hero out of a lump of rock. But hacking a sonnet out of a rock would be a laborious business, and making a hero out of an envelope is almost out of the sphere of practical politics. This fruitful strife with limitations, when it concerns some airy entertainment of an educated class, goes by the name of Art. But the mass of men have neither time nor aptitude for the invention of invisible or abstract beauty. For the mass of men the idea of artistic creation can only be expressed by an idea unpopular in present discussions—the idea of property. The average man cannot cut clay into the shape of a man; but he can cut earth into the shape of a garden; and though he arranges it with red geraniums and blue potatoes in alternate straight lines, he is still an artist; because he has chosen. The average man cannot paint the sunset whose colors he admires; but he can paint his own house with what color he chooses, and though he paints it pea green with pink spots, he is still an artist; because that is his choice. Property is merely the art of the democracy. It means that every man should have something that he can shape in his own image, as he is shaped in the image of heaven. But because he is not God, but only a graven image of God, his self-expression must deal with limits; properly with limits that are strict and even small."

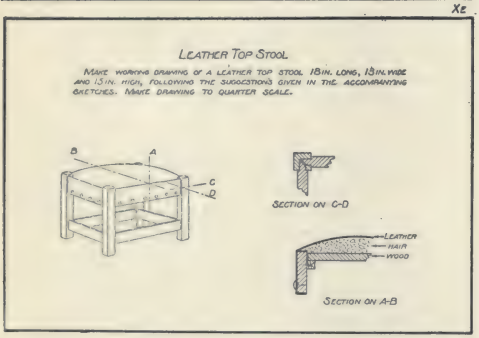
We may wonder what was the provocation that called forth the following from General Samuel Chapman Armstrong:—"I have for many years been preaching that knowledge is not power. Undigested knowledge produces a malady sometimes called the 'big head'."

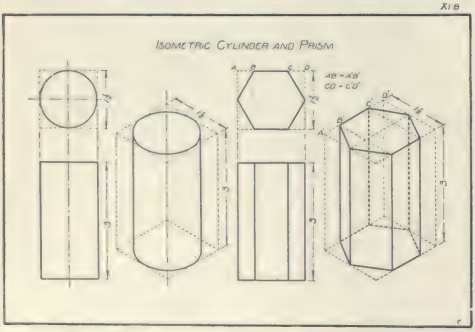
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PROBLEMS IN MECHANICAL DRAWING









By CHARLES A. BENNETT
Professor of Manual Arts, Brad ey Polytechnic Institute

With drawings by FRED D. CRAWSHAW
Professor of Manual Arts, University of Wisconsin

TEACHES STUDENTS TO THINK AS WELL AS TO DRAW

This book is a collection of problems for the use of students beginning mechanical drawing. It is a result of years of experience in teaching the subject and in directing others in such teaching. Altho intended essentially to cover the ground of a first-year high school course, the first part of the book is not too difficult for pupils of the upper grammar grades if the inking be omitted.

The accompanying illustrations show four of the plates, of which there are 88, showing 82 problems. The problems are arranged in groups, each presenting an important division of the subject. In each group the problems are arranged approximately in the order of their difficulty of solution. The proper sequence so necessary for successful instruction in mechanical drawing is an important feature of the book. With but few exceptions the problems are presented in an unsolved form with a skilfully arranged balance between the part given and the part required. Thus copying from the text is prevented and students are forced to develop their powers to think in the graphic language as well as to use pencil and instruments. The problems are both theoretical and applied, and include working drawings, orthographic and isometric projection, revolution, developments and intersections.

The wide variety, the skilfull arrangement and the natural human interest make it a fascinating course to the student. The book has been adopted and is in successful use in high schools and normal schools and has come to be looked upon as the standard beginning text.

Correspondence invited.

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VOLUME XVII NUMBER 7

MANUAL TRAINING AND VOCATIONAL EDUCATION

MARCH, 1916

PRIVATE TRADE SCHOOLS IN CHICAGO.

CAROLINE BENGTSON.

PRIVATE vocational schools are by no means recent. Years ago the high school pupil was besieged with catalogs from the ubiquitous private normal schools which prepared the enterprising person for the county and state examination in the briefest possible period of time. The business colleges have been with us more than half a century but the movement to incorporate commercial courses into the high school is well under way and will result in the elimination of those which are of low standard. So undesirable are their activities in connection with securing students among children in the grammar grades that the Chicago Association of Commerce plans to classify them according to standards of work. An intensive study of this situation in Cleveland, O., has just been made and is published by Macmillan and Company.[1]

A remarkable array of private vocational schools for teaching trades is presented in the advertising columns of daily papers in Chicago. A study of trade schools in the classified columns of the *Tribune* and the *Daily News* reveals the fact that instruction in school or by correspondence can be secured in thirty-two lines of work. Not all of these can properly be called trades as some of them involve no manual dexterity. Training may be secured in architectural, structural, mechanical, and electrical drafting and design; in electricity, plumbing, bricklaying, photography, watch making and engraving; in barbering, hairdressing and beauty culture; in printing and linotype work. Recent invention

[1] "Commercial Work and Training for Girls," Eaton and Stevens.

necessitates instruction in motoring, interurban railway service, motion-picture operation and aviation. Special phases of commercial work have schools of their own, such as telegraphy, filing, adding machine operation, comptometer work, brokerage, salesmanship, freight claim adjusting, secretarial work, and government positions, mainly clerkships in the post-office and in the railway mail service. Since advertising has become a profession, schools are organized to teach the subject as well as special lines, such as sign-card writing and display managing. Schools in trades usually carried on by women are not wanting, for there is a good quota of dressmaking and millinery schools.

Schools giving bona fide addresses exist in Chicago for teaching all vocations mentioned above except three—brokerage, interurban railway service and government positions. There are nine automobile schools, six schools of dressmaking and design, four millinery schools, three schools of motion-picture acting, three schools of motion-picture operating, two each in barbering and comptometer work. Other trades are represented in the advertising columns with one institution each. Forty-six such schools is the total resulting from a study of trade school advertising for one month.

The founders, proprietors, or instructors, as they may be designated, believe that it pays to advertise along several lines. Letters or postals requesting information from eighteen schools brought forty-five replies in a space of three weeks and one establishment has eight documents as its quota. Its next best competitor sent five communications and only seven contented themselves with one missive. Three concerns sent personal representatives to call and present the merits of their respective institutions. One school sent circulars unsolicited. Personal visits were made to sixteen schools and to the state official who has charge of issuing chauffeurs' licenses. Four schools are duplicated on the two lists, consequently a total of thirty schools was studied. One of these is located at Ottawa, Illinois.

An institution which calls itself a technical college is an extremely lavish advertiser. A request for information brought eight pieces of mail, one telephone call, and one personal call. Advertisements in a daily paper ran thus:

> Builders, learn to read building plans, draw, and estimate. Contractors, builders, bricklayers carpenters, plasterers, and apprentices, you need this course. Study plans of buildings now being built—the architects are your personal instructors. You must have this knowledge to succeed as a superintendent or contractor. Day and night classes just starting, also correspondence courses.

Good offices and several rooms equipped for drawing were shown when the plant was visited. The gentleman who was interviewed stated that only subjects necessary for practical draftsmanship and estimating were taught. Mathematics was considered absolutely fundamental but English and economics were frills. Students are admitted who have finished the eighth grade, but they must be sixteen years of age. Those who complete the courses usually go into offices where they assist in making drawings and estimates. As the location is central, the Art Institute and the libraries can be utilized fully by the students. A portion of the quarters was in another building some blocks away. This has been found to be an advantage as it gives the students some necessary exercise. Rules are strict and only fifteen students are permitted in a class. Studies are made from plans so that estimates may be made for contracts.

Circulars indicate that a number of the courses require two years. These are architecture, mechanical engineering, civil engineering, electrical drafting, and design. Algebra, geometry, and physics are required and frequent inspection trips are made. Rates per year are $100 if paid in advance. Credit is given for work done in other schools and several courses are presented which run two or three evenings a week. An engineering office is conducted by the heads of the school. It is located in the same building as the school and in the course of a year's time turns out many designs and detail drawings for all kinds of structural steel work, including office, mill, and warehouse buildings and bridges of all descriptions. Many large contracts are handled each year. It has an extensive acquaintance among architects, contractors, shops, and industrial concerns, many of which send their employees to evening schools. The instructors are men who hold positions with various engineering firms and who give part time to teaching. They are chosen because of practical experience along the lines they teach. Enrollment in the school is heaviest during the winter months when there is little activity in building circles.

Graduates of the school are at work as architects, surveyors in engineering departments of bridge works; as inspectors of bar steel in manufacturing plants; as designers, estimators and sellers, of office, store, and bank fixtures; as resident construction engineers for railroads; and in other related lines. A very large percentage of the students is from outside of the city and many bear foreign names. The school can not be considered strictly industrial as it prepares for "white collar jobs." One of its circulars depicts a machinist at work in overalls and shirt sleeves, and below a gentleman in clean clothes working at a desk as a drafter.

Of course the results of training are shorter hours, cleaner work, and larger salary. The school is a member of the Chicago Association of Commerce.

Electricity, plumbing, and bricklaying, together with the drawing necessary, are taught in a trade school which has branches in various parts of the country. No age limit is set and the school has students of all ages between fifteen and sixty. The cost in each trade is $85 in cash or $95 on the installment plan. A set of working tools and a complete drawing outfit are furnished each student free of charge and there is no cost for materials furnished. Day students finish the work in three or four months, but evening workers need from nine to twelve months. A common school education is all that is needed to make a success of the work and graduation from the eighth grade is not a necessity.

A visit to the institution reveals the fact that a former Chicago public school has been remodeled to carry on the work. Bricklaying occupies quarters in the basement. One instructor always handles all the students and the number is large during the winter months. On April 28th, when the visit was made, one lone Japanese was industriously building a fire-place. One instructor handles fifty students in electricity and is given an assistant when the number goes above that point. One instructor and two or three student assistants managed forty men in plumbing. The brighter students assist the slower ones. The guide said that experience had proven that men do not learn a trade well when there are numerous instructors to do the work for them. Talking is allowed but no boisterous or rough conduct is tolerated. The average age of the students is high, being around twenty-five years. Much effort is made to satisfy students as a successful man will send four or five more from his home town. Night pupils are mainly from the city. Older students are preferred as they are serious. The adolescent does not know what he wants and wastes his time. Sometimes a boy begins electricity and finds it beyond his depth. He will then try plumbing and may pass on to bricklaying.

The school which teaches photography makes its appeal for students to the class of men who will need to increase earning power. Courses are given which are suited to the needs of both amateurs and professionals. Commercial photography is a field of increasing importance as newspapers, magazines, and mail-order houses requisition skilled men every day. A studio is located on the same floor as the school and advanced students are given opportunity for practice under actual working conditions.

Watch making and engraving are related lines of work which are carried on in connection with the jewelry business. Six months is sufficient time to prepare the average person for the business. This does not mean that the student will be able to turn out a watch but he will know how to locate trouble in a watch of standard make and will be able to take it apart, replace the broken or worn-out bit of machinery and reassemble the parts. He will be able to repair jewelry of the ordinary grades. Individual instruction is given in designing and engraving. After the first three months those who are sufficiently advanced may enter the profit-sharing repair department where some money may be earned.

Two schools teach barbering. They are branches of schools which exist in the principal cities of the country. Instruction includes the care of tools, disinfection, sterilization, facial massage, electric and vibratory treatments, shampooing, bleaching, dyeing, and the manufacture of various kinds of cosmetics, toilet waters, and face creams. At one of the schools actual practice in shaving and hair cutting is secured by giving out tickets at various charitable institutions to deserving men. The other school is located in the cheap lodging house district and candidates for free shaving are easily secured. The latter school will take boys fourteen years of age and allows 20 per cent commission on all students sent to it. The institution claims that its standing is very good because the *Tribune* accepts its advertisements. This newspaper has on certain occasions constituted itself a censor of fake schools. In each school tuition includes a set of tools. One of these concerns offers instruction in hairdressing and beauty culture. Quarters are good and numerous customers furnish material for practice. Fifty per cent of the people who take up the trades connected with beauty parlor work are from outside of the city.

The importance of the automobile industry is reflected in the fact that nine schools offered instruction in various phases of the work. The requirements for a chauffeur's license, as indicated by the official who has charge of the work, are as follows:

1. Three reliable references.
2. A written test of twenty questions.
3. An oral test.
4. A road test.
5. A mechanical test.
6. A fee of $5. (14,000 licenses are issued in a single year.)

One school which is a persistent advertiser and issues an elaborate catalog, has been in business since 1902. The general-manager says that he started out with the determination to make his college of motoring the best school for automobile instruction in America. He says that he has succeeded because of careful attention and honest treatment of the students, by keeping equipment up to the minute, by being always ready to discard the useless and out of date, and finally because he was backed by ample capital which enabled him at all times to keep pace with changing conditions in the automobile field. The rapidity of these changes constitutes one of the serious difficulties in making possible the training of people for the various lines of the automobile business in the public schools. Constant changes in equipment are necessary; also teachers who will follow improvements as they are made.

Instruction in the automobile schools consists of the study of the different parts of the machine by means of drawings and lectures, proper care of the machine, how to make ordinary repairs, and driving lessons. Some schools teach several makes of machines. The instructors are practical men. A single school has a faculty of eight members, one of whom is a college graduate. One school gave the official who issues licenses as a reference but he refused to verify any statements. He admitted that the schools turned out people who could pass examinations, tho newspapers charge that the full requirements stated before are not called for. He gave the impression that instruction was rather expensive and that there ought to be places where it could be secured free. The tuition fee increased as the amount of time expended by the student is decreased, and as most schools are combined with garages and repair shops the work done by the student was a compensation for the concern if the rates were low. Courses of instruction cost from $10 to $150.

Interurban railway service is an occupation which appeals to people who care for out-of-door work. Preparation for the work is entirely by correspondence and the fact that many people enter the service without such training brings up the question whether this additional schooling, if such it can be called, is necessary. Certain qualifications are set for employment, the most important of which is reliability of character. After completion of the course the person is recommended for employment in his own locality, but two reliable persons must vouch for his character.

Motion-picture operating is unionized and a system of apprenticeship lasting a year has been arranged. Two schools give a course of instruction lasting three or four weeks and costing $30 to $40. Possibilities of

expansion in the moving-picture business are great, as its value in educational work is hardly appreciated as yet. Along with the mechanics of operation, instruction is given in the rules of underwriters and the municipality for fire protection. Courses in motion-picture acting were advertised by three schools. The *Tribune* gave much space to the exposition of one of them as fraudulent. Three students had been secured. Lessons were five dollars each and after payment of twenty-five dollars the subject would be told if he had possibilities as a star. One girl had paid sixty dollars after which she was told that she had no capacity. Ordinary talent for acting and features that take well are the only requisites necessary for this phase of the work.

One school of aviation was advertised. The course cost $450 for twenty-five lessons or $20 per lesson in case the student wished to pay on the installment plan. Instruction was offered by a firm engaged in manufacturing aeroplanes. Acquisition of knowledge in the newest variety of transportation is therefore limited to people with some beginnings of capital.

Instruction in telegraphy is offered by a school which advertises that the work offers steady employment at good wages. Telegraphy and wireless are said to be trades which are not overcrowded. The school claims to act officially for the Western Union Telegraph Company and is authorized to train station agents for the Illinois Central Railway Company. The equipment, as described in circulars, consists of standard Western Union Company instruments and switch-boards. There are six stations and four main line wires running around the schoolroom for testing purposes. The Morse code is taught, also the receiving and sending of messages, together with typewriting and penmanship when necessary. The length of time required for completion of the course is four to six months and the cost is $45, or $10 a month in six payments. The instructors are people with practical experience. Before you are accepted as a student you must give a complete account of yourself and two responsible citizens must vouch for the truth of your statements. The circulars devote some space to the discussion of unions among telegraphers. Hearings of the Federal Industrial Relations Commission brought out the fact that much dissatisfaction with working conditions exists. The general tone of the discussions in advertising by the school would indicate that it is a corporation concern organized for the purpose of maintaining a supply of new employees. The labor unions would make the charge that the institution exists in order to make available plenty of strike-breakers in case of industrial difficulties.

A filing school advertised for a number of weeks but all that could be found was the name, "The Universal Filing School," on the door of an office on Michigan Avenue. An adding machine school which also taught the use of the comptometer was held in quarters provided by a large corporation which manufacturers and sells the machines. Besides students paying tuition there were arrangements for instructing girls who came from offices where these devices were being introduced. Demonstrations were carried on for an hour or two so that these employees could understand manipulation. Two comptometer schools offered instruction for an eight weeks' course for $40. A few minutes' explanation makes clear the workings of the machine but training is necessary in order to acquire speed. Commercial departments in the high schools could easily give the instruction if machines were available.

A chain of schools offers instruction in salesmanship by correspondence. The supply of literature sent forth is so voluminous that there should be no difficulty in convincing any person who has ambitions to become a traveling salesman that the course is of benefit. Many testimonials are appended. All correspondence courses are founded on the assumption that the person can acquire ideas from the printed page so that a certain minimum of education is necessary. No references are made to this fact and there are statements that people of all ages can succeed in the business. The school secures positions for persons who complete the course, but two vouchers are required before employers are approached.

One institution advertises preparation for secretarial positions of high grade, some of which pay as high as $10,000 per year. No consideration is given the fact that most high-salaried positions are attained by gradual advancement of efficient persons who are familiar with the details of the business. Cultural English is a part of the course and the manager emphasizes the fact that he knows what traits of character the successful secretary must possess and that he can point out the way to acquire the qualities which are so desirable. College graduates may complete the work in about one-third of the regular time, but they must pay the full tuition for such vocational advice and training as they secure.

A school for advertising offers day and evening work by correspondence or by individual instruction. Evening classes are started every Monday and the work consists of forty-two lessons studied at home and the same number of lectures given personally by instructors. Students enter the day class at any time, devote four hours per day every day except Saturday and are really private pupils of the director. The

course can be completed in four months' time and tuition is $100 with a discount of 10 per cent for payment in advance. The advertising man must know how to produce an effective message. In order to do this he must be familiar with the terms used by the trade, typography, selling plans, how to make an appeal, how to find selling points and how to find a market. He should know whether to use copy which is inspirational or which states reasons, and how to plan a complete campaign. Testimonials from successful students are appended. No entrance requirements are stated and attempts to carry the course by people lacking qualifications will certainly result in disappointment and financial loss.

A sign card school is located on the fourth floor of one of the older buildings in the loop district. There is no elevator and the quarters are unattractive. At the time the visit was made six boys and one girl were seated at drawing tables working with only fair light. Circulars state that the school was founded in 1910 as a practical trade school to fill the increasing demand for show card writers and sign letterers. Sign painting and card writing can be learned in a few months. No talent is necessary to become a successful letterer and a student who has artistic ability can in time become a leader. The length of time needed is uncertain; all depends upon the student. Anybody can learn. The cost is $48 for the beginning course and $80 for complete instruction. Boys are not preferred as they play too much. Men who know what they want and are anxious to make good are considered desirable students. The instructor and proprietor said that he organized the school to keep himself supplied with help for his business. Assuredly this is high finance; instead of hiring workers and paying them, organize a school and have them pay for the privilege of giving their time. The school could refer to men who had received instruction and who are now employed at good salaries.

The Chicago Display Managers' School advertises personal instruction in retail advertising, window and store interior display, and show-card writing. The president of the school states that he has had fourteen years of practical experience in display managing, five years of retail experience as a buyer, sales-manager, and general advertising counsel for department stores, and was president of the International Association of Display Men in 1908. Three other instructors are men of practical experience in handling show window displays, show-card writing, and in designing displays and fixtures for men's wares. A four to six weeks' course can be started any Monday. In the men's wear course forty-five demonstrations of setting up men's clothing, men's furnishings,

and shoes are given, and afterwards each student is required to set up each display under direction. In general window trimming instruction the student learns to handle all kinds of piece goods, small wares, lace and embroideries, undermuslins, draping materials, women's suits, dresses and gowns. Show-card writing provides actual practice. The retail advertising course is arranged to give practice and application to all lines of dry-goods department stores. A number of combinations of courses of varying lengths of time and rates are given. A six weeks' combination of three lines, window trimming, show-card writing, and retail advertising is given for $100. A student may enroll for a week without payment of fees to find out whether he likes the work.

Dressmaking schools are fairly numerous. Some of them can rightfully be called trade schools as they prepare the student for positions in the various dressmaking establishments and for department store work. One of them has good quarters in the loop district and gives courses in drafting patterns, cutting, fitting, and in designing. The work in drafting, cutting, and fitting costs $20 and requires two to four weeks to learn. The square and tape are used in cutting and no chart is needed. People inexperienced in sewing may then enter that department where tuition is $2.50 per week or $8.00 for four weeks. Pupils are taught dressmaking, ladies' tailoring and all kinds of trimming and finishing. They may do dressmaking for themselves or for their friends and may bring people to the establishment where assistance in carrying out instructions is given. Those who have no knowledge of sewing usually spend two or three months in this work, but dressmakers and seamstresses need only a few weeks. The course in designing is intended for those who wish to acquire this branch of the trade and the work includes drafting all kinds of draped patterns. The cost is $18 for six weeks. Thruout the period during which the student is receiving instruction the loss of a day's time is not serious, as she begins the work where she left off before absence. Numerous schools exist which are intended primarily for the woman who wishes to learn to make her own clothes. Chains of such schools exist in the city and branches are to be found in the larger towns thruout the country.

Two millinery schools were visited. Both offered courses of instruction lasting eight weeks for $35. One school could accommodate twenty-five pupils and the other twelve. In the latter establishment the lady in charge filled orders for customers and the girls were taught to handle the various materials. The manager recommended that the girls work in wholesale houses for two years in order to acquire speed. The other

school permitted the girls to take orders from friends and gave instruction in carrying out the work. A circular states that the course includes sketching, trimming, and designing, lessons in buying, the way to wait on customers, the manner of conducting parlor millinery, and art in advertising and in giving special sales. When the lady in charge was asked about opportunities for positions she said that students were advised never to say that they had acquired knowledge of the business in a millinery school, but when questions were asked they were to say that they had been several weeks with Mrs. H———.

Private trade schools resort to various expedients in order to attract students. Advertising in the daily press, numerous circulars and letters, commissions for securing students, want ads offering positions, discounts for cash payment of tuition, payment of tuition on the installment plan, and promises to secure positions are efforts of this sort.

Advertising is not to be condemned so much from the standpoint of quantity as from considerations of common honesty in making promises. Persons in charge of the public evening schools of Chicago know that advertising is absolutely necessary and it has been found worth while to inform grammar school graduates about the content of various high school courses. Some of the trade school advertising is conservative and statements can be relied upon, but it is well nigh impossible to verify their claims as the person who discovered that the work was not suited to his needs after he had paid his tuition can not be found. Only the testimonials and addresses of the people who have made good are available. There are points about trade school advertising which men in charge of public schools could well afford to study since many of the lines of work now carried on in the grammar schools are vocational in character and are effectively taught. The general public is largely ignorant about these facts.

While trade schools do not conduct employment agencies they keep in close touch with employers who will take their students. Several of the schools state that the previous work of the student and his character must be vouched for. This is true of persons desiring to enter the automobile business, the interurban railway service, telegraphy, and traveling salesmanship. No doubt there are employers who turn to the trade schools when help is needed. One automobile school representative said that there was no difficulty in placing students in positions as calls for men came frequently. Further study would be needed to determine whether these positions are permanent and satisfactory. Investigation of

placement by business colleges has revealed very unsatisfactory conditions.

Payment of tuition on the installment plan has its advantages. If the student finds that conditions have been misrepresented and that he is not adapted to the work, he can withdraw with much less loss than if the full amount had been paid. On the other hand, penalty for partial payment is somewhat high, since it is an item of ten dollars or more in some cases. When a young person is starting out in life the amount means a good deal and it is certainly of some consequence to a man with a family.

The quarters in which these schools carry on their work are of all kinds and varieties. This is to be expected since anyone who has cash enough to rent quarters and buy furniture can set up a school and attempt to give training of one kind or another. In one comptometer school furniture and equipment were up to date and attractive, but the students sat facing the light. One room for teaching dressmaking was a barn-like affair with long tables where fifty persons could be seated. Necessarily the schools have the trade, not the educational aspect, since many of them actually market commercial products. Storage for materials is inadequate in many cases.

In many lines of work tools are supplied so that the worker is equipped with means of carrying on his trade. The cost is included in the tuition paid. So much wrangling and quarreling about textbooks has prevailed in some of our public school systems that the question of providing tools for pupils taught definite trades would be a difficult one to meet. On the other hand, some trade schools are probably organized to further the sale of certain kinds of equipment. In the barbering and hairdressing establishments very well arranged displays of tools needed can be seen in storerooms planned for the purpose.

The cost of trade instruction in the few cities where it has been attempted at public expense is very high. In the private trade school cost per student is relatively low and the managers make a profit on these rates or they would not remain in the business. There are a number of reasons for low costs: Some concerns run very large classes, utilizing the brighter students to assist those who comprehend instruction less easily; many establishments use the labor and time of the students in producing materials which have a regular market value; they use crowded quarters and have no space for halls, study rooms, libraries, and other paraphernalia of ordinary educational institutions; they teach

nothing except matter directly related to the trade in question. Civics, economics, and English are eliminated.

Numerous private trade schools are located in Chicago because it is a large city where specialization in trades can be carried much further than in localities of even 100,000 population. Certain phases of advertising, for instance, can exist only in a great center of population. The large aggregation of foreigners also encourages establishment of trade schools. Trade training is a regularly accepted feature of the education of the industrial classes in the more advanced European countries and the impossibility of securing satisfactory apprenticeships leads many of the foreign born to attempt to secure this instruction for their children in the private trade schools.

Americans are sentimental and not practical in educational as well as in other social lines. That people who are crippled and maimed should be taught trades so they will not be beggars on the street is an European idea which might well be applied to unfortunates in our own cities. Chicago has no provision for trade instruction at public expense outside of the evening schools and high schools. The David Rankin Trade School, in St. Louis, admits men and boys over sixteen who have finished the work of the sixth grade or its equivalent, and applicants with trade experience may be admitted with less schooling. Boys between fourteen and fifteen who have completed the sixth grade and show aptitude for trade instruction may be admitted to a preparatory division and those between fifteen and sixteen may be admitted to the preparatory division or the regular day school. Four-year and two-year trade courses in the high schools are based on academic, not on industrial, methods as is the case with the Williamson Trade School near Philadelphia. Courses in sewing, both in day school and evening school, are adapted to the woman who wants to make her own dresses and hats, but are not suitable for people who wish to learn the trade. The University of Chicago Settlement has attempted trade instruction in sewing, but the struggle for existence parallels that of the early days of the Manhattan Trade School.

Certain phases of engineering, as steam engineering and refrigeration, can be acquired in Chicago only at Armour Institute, which is an institution of college grade. Outside of private trade schools, instruction in advanced commercial work, such as advertising and salesmanship, is available at the University of Chicago and the Northwestern University School of Commerce. Some of the graduates of the four-year commercial course in the high schools are very successful as salesmen.

The possibility of entering at any time appeals to men in trades where there is a slack season. The David Rankin Trade School makes provision for this class of people and the Coyne Schools undoubtedly supply the need to a certain extent for Chicago. Entrance at any time also does away with odious comparisons made about the slow worker. In some lines much individual attention is possible, tho there are limits to efficiency acquired under an instructor who does much of the work for the student.

Chicago should have several endowed trade schools for students who can not handle regular school work because of maturity or lack of preparation. Private trade schools now supply the needs of persons who, because of industrial vicissitudes or failure of health, must acquire a new occupation. Society should provide for this condition when it occurs thru no fault of the worker in the same manner as it supplies free university education. A system of scholarships whereby deserving persons might take advantage of instruction in the private trade schools might be of some help in solving the problem. This would necessitate careful study of the work accomplished by the schools and many people would save hard-earned cash as there would be some guidance for prospective students.

The private trade schools of Chicago supply vocational training for a considerable group of the population. Many of the students have come from smaller towns where trade training can not be secured. Where instruction is given by persons with actual experience in the trade and under commercial conditions the time and money of the student is by no means wasted. The demand for instruction in relatively new lines such as motion-picture operating, aviation, and automobile engineering, is met. These schools are open to the charge of catering to white collar jobs and many are established to meet license requirements. Teachers in certain departments of public school work might well follow the close study of business and industrial conditions which enables these private concerns to meet the needs of people who need vocational education.

VOCATIONAL GUIDANCE IN THE STADIUM HIGH SCHOOL, TACOMA, WASHINGTON.

C. E. Westgate.

IN view of the fact that vocational guidance involves two problems—the shop or job, and the boy—and as we have four years in which to study the boy while he is developing and changing, we have taken up the shop or job side of the question first in Tacoma.

We believe that, in order rightly to direct a boy into any vocation, we must first know the chief characteristics of the vocation; what is the nature of the work done; the requirements for entrance; possibilities for employment and advancement; amount of instruction given; wages, and other conditions. We also believe that the most profitable way to get this information before the boy is to have the boy investigate for himself.

With this in mind, we have organized three student clubs for boys in the Stadium High School: the Commercial Club, for boys who expect to go into business; a College-Professional Club, for those who expect to take up professional work; and an Industrial Club, for boys who are interested in the various industries. Boys above the freshman year are eligible for membership, and each club is under the direction of a faculty member, who serves with the chairman and secretary-treasurer on a committee which has charge of the programs and also appoints the investigating committees.

The aim of the Industrial Club is as follows: To investigate industrial conditions in Tacoma in order that we may know, should we choose to follow a certain vocation, just what that vocation has in store for us as regards: the character of the work, the possibilities for a position, the chances for promotion, and the wages paid. We are also investigating conditions in the school. We find that about 80 per cent of the boys who enter school in the freshman year fail to continue and graduate, and that only about 50 per cent of those who graduate go to college. We believe that thru the findings of the clubs, both those who drop out and go to work, and those who graduate but do not go to college, will be benefited.

We now have fifty-one boys in the machine-shop, and one hundred and thirty-one boys taking forging with the intention of taking machine-shopwork soon. They should know how large the field for machinists is. They may be ever so well trained, but if the demand for them is

small, they will not only be forced to work at a low wage themselves, but they will force those out who are now in the machine-shops. Care must be taken to keep the supply and demand equal, or, perhaps, the demand a little above the supply. If we fail to do this, the Trade Unions will condemn our work very severely, and they will have good cause for doing so.

The work of investigating is carried on by committees of the students —four or five boys on each committee. Each committee has a definite problem for investigation. We have decided on the following list of items to cover the information we wish to procure:

1. Special lines into which the trade is divided.
2. Number of establishments in the city.
3. Number of men employed by each.
4. Number of boys employed by each.
5. Requirements for entrance.
6. Length of apprenticeship.
7. Amount and character of instruction given boys.
8. What training the school can give that will benefit the boys.
9. Possibilities and method of promotion.
10. Wages paid.

We found it impossible to cover the entire field of industries in Tacoma, so chose the following twelve as the most important to begin with:

1. Architectural and mechanical drafting.
2. Automobile repairing.
3. Forge-work.
4. Carpentry and building.
5. Electrical work.
6. Cabinet-making.
7. Lumber manufacturing.
8. Machine-shop work.
9. Printing.
10. Pattern-making and foundry.
11. Plumbing and gas-fitting.
12. Sheet metal work.

Each club meets every three weeks on Tuesday morning at 8:30. We find this to be the best time as it interferes least with other work. We can also get speakers in at that time, when they are on their way to work, without inconveniencing them to any great extent. We plan to have men from the various industries speak to the club from time to

time. They may include the manager or the superintendent or some of the men employed. They can give valuable information on their experiences. By way of suggestion, and to avoid waste of time, we place in their hands the following items to speak on:

1. What sort of boys I would like to employ.
2. What I expect of a boy who works in my establishment.
3. Method of advancing boys.
4. Difficulties I have had with boys,
5. What the school can do for the boy in the way of preparation for the job.
6. Method and extent of instruction given boys, and any other special information which we wish to get.

After the talk a short discussion follows by questions from the boys.

We try to point out to the boys the desirability of joining the proper club. The general inclination seems to be away from industrial lines. Most of the boys seem interested in professional club work, and are very likely to be urged to do so by their parents. Our clubs started out with one hundred and fifty-one boys in the College-Professional Club, ninety-two in the Commercial Club, and only forty-five in the Industrial Club, notwithstanding the small proportion of our boys who graduate and go to college, referred to above. We have found that only about 6 per cent of the entire population in one of the leading cities of this state are in the professions. We need, therefore, to bring the real conditions before the boys in order that the time spent in high school may be of the most benefit to them.

We believe that the boys who are investigating the conditions in the industries will come in contact with real conditions of life outside the school, and will be able to make a more careful and profitable selection of work as they go on thru school. In an investigation which was conducted last spring, we found that nearly 50 per cent of the boys wished to take up electrical engineering. Very few of them knew what sort of work this is, whether they could fit themselves for it, what the requirements are, and whether the field is large enough to accommodate them all.

Our course in manual training is so arranged as to give the boys a choice of work to quite an extent. The 9 B's have a choice of elementary woodwork, wood-turning, or sheet metal. The 9 A's may take carpentry, or forging, or one of those not taken before. The 10 B's may take concrete work, or pattern-making and foundry, or those above. The 10 A's may take machine-shopwork, or cabinet-making, or any work

not taken before. The various kinds of mechanical drawing, sign painting, and show card writing alternate with these. After a boy has tried a few lines of work and thinks he would like to do special work during the last two years, he may select any one of the following subjects and spend full time therein: carpentry, forging, cabinet-making, machine-shop, architecture, machine design, pattern-making and foundry.

IF PARENTS AND OTHER TRAINERS WILL LAY ASIDE THE DETERMINATION TO FORCE THE YOUTH INTO SOME PARTICULAR VOCATION, AT THE SAME TIME DEVELOPING HIM WISELY AND ROUNDING OUT HIS INNER NATURE THROUGH TRAINING, THE TIME WILL COME WHEN HE WILL BE PREPARED TO MAKE A WISE CHOICE FOR HIMSELF. FOR, AFTER ALL THAT IS BEST HAS BEEN SAID AND DONE BY OUTSIDERS, THE INDIVIDUAL HIMSELF, AND HE ALONE, IS IN THE TRUE POSITION TO EXERCISE THE WISE CHOICE OF A CALLING.

—William A. McKeever.

RESEATING A CHAIR.

L. Day Perry.

IN many localities it is impossible to find a professional to reseat caned chairs. Many chairs in good repair and worthy are relegated to the attic because of broken or sunken caned seats. Upholsterers generally will not be troubled with such jobs of caning, for the work does not pay unless there is an amount sufficient to keep them steadily em-

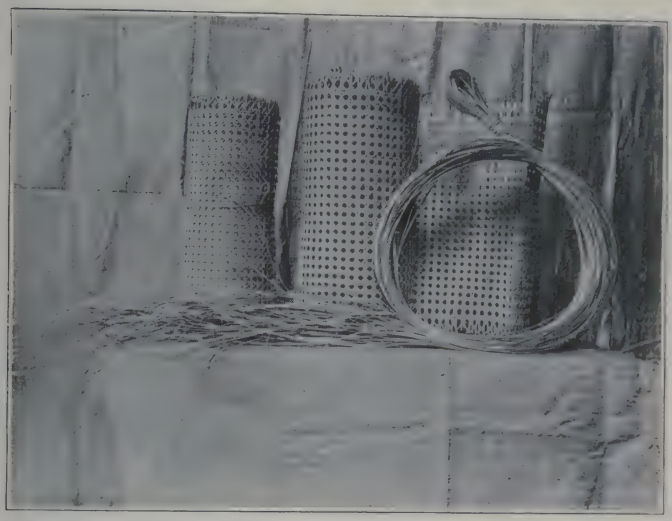


FIG. 17. HANK OF CANE AND ROLLS OF MACHINE WOVEN CANE.

ployed. Usually, they are not adept enough to do such odd jobs as may come to them, even tho willing to do the work, within a time consistent with good money returns.

Ordinary chair seats may be caned for a minimum of one dollar and a maximum of two. If the holes have previously been bored, much labor is thus avoided, and the charge naturally made less. The professional cane weaver has various ways by which he determines the cost for recaning a given seat. Perhaps the most common method employed is that of charging so much per hole. This may be from one to two cents. The difficulty encountered in handling very fine cane is also a factor in deciding what to charge. Usually a casual looking over of the chair by the expert is all that is necessary to fix a price. No charge of less than one dollar on any seat will sufficiently remunerate the worker.

Any boy who has had instruction and sufficient experience in caning in the manual training shop may readily undertake jobs of caning. The boy who will investigate will find that he may work up a sizeable trade in chair seating in a short time. In fact, several boys will not overcrowd a given field. The work will pay an amateur well, as he does

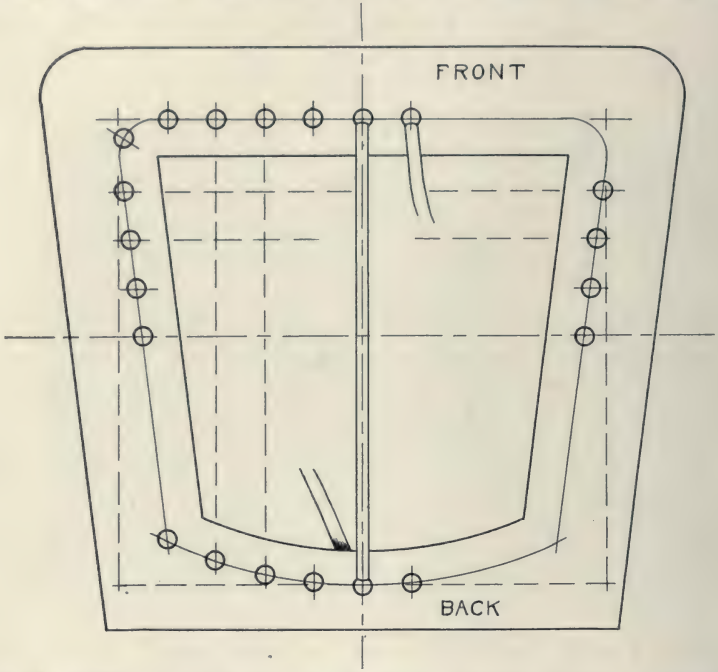


FIG. 18. SKETCH OF CHAIR SEAT OF ODD SHAPE, SHOWING METHOD OF FINDING LOCATION OF HOLES.

not, nor cannot, expect professional wages. Such work is of considerable value from the pupil's standpoint alone—that is, this correlation with his manual school activities. He would undoubtedly find willing help at his shop at anytime a job of peculiar treatment presented itself.

Many chairs which the owners would want hand caned have not holes bored for the work. They previously held machine woven cane. Fig. 18 shows a sketch of the ordinary chair bottom. The area is irregular. The sketch shows the method of determining the location for the holes.

As stated in the discussion of the seven steps in caning, the holes are invariably ½" from the inner edges of the rails. In this instance the line from which the holes for the front rail are located, is parallel with

the front rail; it is coincident with the line on which the holes are bored. The line on the back rail must be parallel with it; the line runs thru the center of the center hole. The lines on the side rails are parallel to each other and at right angles to the first two. These four lines are shown in dash lines on the drawing. Their function is simply to determine the location for the holes to be bored on a line ½" from the rails. These are not shown on the sketch, except as they may be coincident with the working lines.

When these working lines are determined, the centers of the front and back line are located. Then lines connecting corresponding holes on the front and back rails must be parallel to the line connecting the ceter holes on these rails. This rule applies to the boring of the holes on the side rails. It also applies to seats of any odd shape. The distance between holes will vary somewhat at different places on the seat. This is the result of working to rule, and is necessary to keep strands equidistant and parallel. At times re-spacing at several places will be necessary. When it is, simply redivide into as nearly the given dimensions as possible.

After the holes have been bored and cleaned the seat is ready for caning. Start at the center hole at the back. Pull the cane up thru this hole, and across the frame, and down the center hole at the front. Work either way of the frame. Fig. 18 shows a cane started in this manner. It is best that the amateur work from the center, both ways. He may begin otherwise when he understands the work better. The caning operations on the seat to be shown are the same as those described in the seven steps in caning. They never vary. The only new thing involved here is the shape of the seat. Fig. 19 is a photograph of a chair seat of an odd shape, an irregular ellipse. It shows the first step half done. Note here that the last strand skips two holes, one at the front and one at the back. This is necessary to keep strands as nearly the same distance apart as possible. Fig. 20 shows the first step completed and the second partially done. It is not necessary to start at the center with this series, altho it is advisable with the beginner. Note that two holes have been skipped here, as in the first step. Fig. 21 shows the second step finished and the third under way. These strands run directly over those of the first series. Pegs are used always to keep strands taut. Their proper use has been explained. Fig. 22 shows the third step completed and the fourth under way. This shows the actual weaving, and the method of using the needle. It has been pushed thru in the manner previously described, and is shown threaded, ready to be pulled



FIG. 19. FIRST STEP HALF DONE.



FIG. 20. FIRST STEP COMPLETED. SECOND BEGUN.

back, thus making the weave. The needle may not be used, but will do the work rapidly. Hand work alone here is tedious. Fig. 23 shows the diagonal weave under way. In Fig. 24 this weave is completed and the second diagonal started. Fig. 25 shows the method of fastening the binder. This has been described.

The first three series of strands should not be pulled very tight, otherwise the final weaving will prove difficult. The finished seat, when dry, should ring when struck sharply with the fingers.

The method of tying cane, preventing twists, etc., has been explained, so reference should be made to these points, which may not be fully understood in this discussion of chair seating.



FIG. 21. THE SECOND STEP FINISHED AND THE THIRD UNDER WAY.

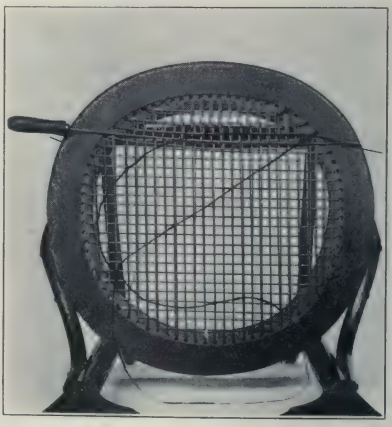


FIG. 22. THE THIRD STEP COMPLETED AND THE FOURTH UNDER WAY. THE CANING NEEDLE IN USE.



FIG. 23. THE FIRST DIAGONAL WEAVE UNDER WAY. THE FIFTH STEP.

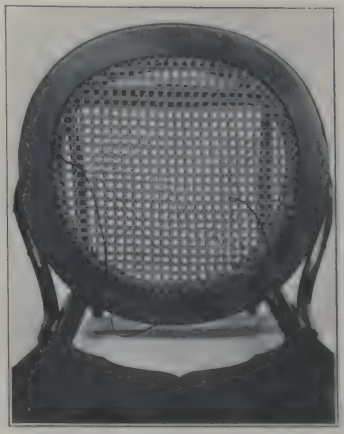


FIG. 24. FIRST DIAGONAL COMPLETED AND THE SECOND BEGUN. THE SIXTH STEP.

The refinishing of chairs is a distinct problem, but one which the cane weaver should understand and be able to do. However, explanation of the processes is not within the province of this article.

Note that many holes have been skipped in each series, and especially in the last two, and also, that more than one diagonal of a given series enters the same hole. In every case it will enter that hole which leaves its course in as straight a line as possible. In rectangular areas it is never necessary to run two diagonals in the same hole, except corner ones. This applies to two diagonals of the same series.

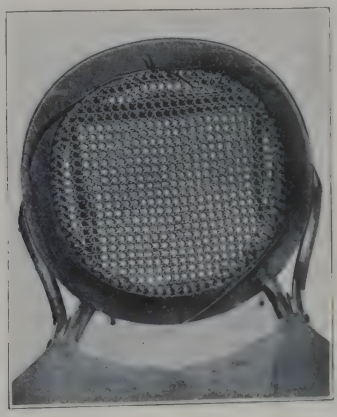


FIG. 25. METHOD OF FASTENING BINDER. THE SEVENTH AND LAST STEP.

THE SCHOOL FACTORY AT BRADLEY INSTITUTE.

CHARLES A. BENNETT.

AS one goes from city to city visiting the newer types of industrial school shops it is easy to get the impression that many advocates of vocational training think there is special virtue in the fact that a school shop is turning out a marketable factory product. Such men seem to think that all that is necessary to be done to bring shopwork up to date is to have the boys manufacture stools to sell to the local furniture dealer or study tables to sell to the Board of Education, or to make the equipment for a teachers' rest room in the high school. The inference seems to be that the school shop that can do such work must be a superior shop; it must be giving real vocational training.

On the other hand, any person who has had real vocational experience in a woodworking shop, who is acquainted with the processes of manufacturing, and at the same time is acquainted with the processes of teaching, is well aware of the fact that it is quite possible to get a group of boys to turn out a salable product without teaching them much of any thing. Even the factories can do that. They are doing it right along, and it is because such a factory system is an educational failure that schools for vocational training are needed. The accomplishment of such a feat in the school is no more guarantee of real vocational education than when the same thing is done in a factory. Merely turning out a valuable or salable product is no adequate criterion for a school shop.

A factory may or may not be a good educational institution, depending upon the way it is organized and administered. If it employs educational methods and keeps education as the chief aim, it may be a good school; if it makes material products its sole aim, it is not fundamentally an educational institution at all. A man working in it may "pick up" a trade or a part of a trade, but he might get much more of the trade in the same length of time were the shop organized to teach instead of to make money. Even the large factories are recognizing this fact and the corporation schools are teaching their apprentices at first in a shop that is either non-productive or nearly so.

It was with some appreciation of this point of view that Bradley Institute, in the year of 1911, set out to discover thru actual experiment some of the possibilities of utilizing a producing woodworking factory as a means of teaching a vocation and as further aid in training teachers of vocational woodworking. It was realized that this was not entirely a

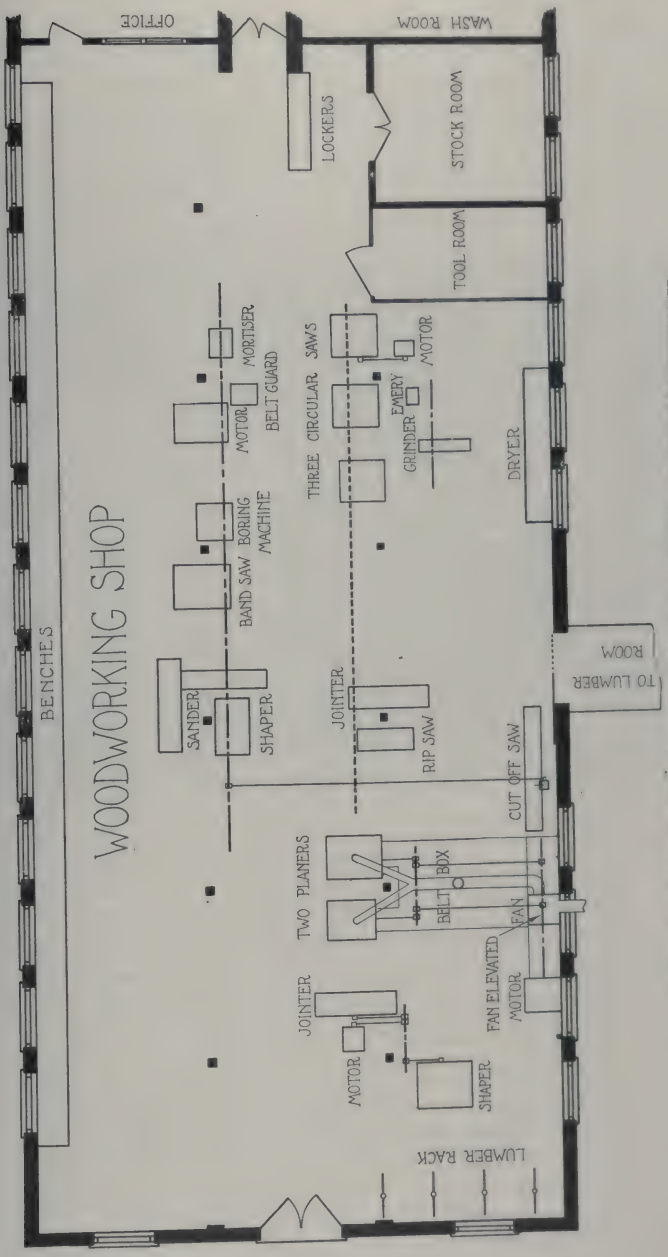


FIG. 1. PLAN OF THE FACTORY WOODWORKING SHOP AT BRADLEY INSTITUTE.

new experiment for similar work had been carried on successfully at Hampton Institute, Virginia, and in other places. But the conditions at Bradley Institute seemed favorable for testing certain claims concerning methods of vocational training and the educative value of factory shop experience.

To go into all the difficulties encountered and the means taken to solve new problems would take one beyond the limits of the present



FIG. 2. THE TRUCK—AN ESSENTIAL FEATURE OF A FACTORY SHOP EQUIPMENT.

article, but it is possible briefly (1) to state a few facts concerning the material equipment of the shop; (2) to explain the cost system adopted; (3) to give a summary of the results in manufactured products; (4) to state the main facts concerning the organization of the subject-matter taught and the method of procedure in teaching; and (5) to give a few conclusions based on experience.

The room selected for the factory shop was 40 by 100 feet. It was fitted up with the usual woodworking machinery as indicated in Fig. 1. In arranging the machinery the first consideration was facility in handling the work. In other words, the considerations were chiefly those of equipping a commercial factory. The main difference was in having a long row of benches on one side of the room, but these were inherited from a former school shop and might not have been quite as numerous

under other conditions. Also, some of the machinery was inherited, but that was essentially what would have been purchased if it had not been already on hand.

There was one entirely new feature of the equipment which we have come to look upon as essential in any school shop that adopts factory methods, and that is the trucks, Fig. 2, for storing and carrying material in process of manufacture. Whenever I go to a school woodworking shop that claims to be giving vocational instruction by factory methods, I at once look for the trucks. If woodworking machinery is there and the trucks are not, I begin to question in my own mind whether I am in a vocational shop, or in a manual training shop. In other words, the truck has come to be, in my mind, the symbol of the woodworking factory shop. I am not able to conceive of modern factory methods being carried out in a real way where no such trucks are available. This, then, is a summary of the factory shop equipment: machines in sufficient number with plenty of trucks, and all so arranged that there is sufficient space around the machines for the placing of the trucks, and a clear aisle for trundling the trucks of material from one part of the shop to another. To this should, of course, be added the statement that the machines must be so arranged that a job may be routed without undue waste of time in going from one machine to another.

No school can afford to maintain a woodworking factory without disposing of its products in such a way as to pay for the material used. This becomes a problem because a woodworking factory requires a large amount of lumber to keep it busy. Some schools can find a market for their school factory products in their own institution; others will find it necessary to seek a market for at least a part of their products. Bradley Institute has pursued the latter course. It manufacures for its own use, and then sells to schools a limited quantity of products, such as drawing boards, workbenches, drawing tables, cabinets, samples of wood, mitered table legs, and cases for unfinished work. It also does occasional special jobs by contract, when they are needed to keep up a sufficient supply and the requisite variety of work.

In order to handle all this work in an intelligent and businesslike way a cost system was adopted. Before adopting this, however, several systems were studied, and finally a very simple one was decided upon. The blanks used are, first, the shop order sheet, Fig. 3, which is made out in the business office of the Department of Manual Arts and forwarded with the drawing or other specifications to the teacher in charge of the factory shop. These order forms in duplicate are made up in

SHOP ORDER NO._____

Date of Issue_____

To_____Department,

Under the Supervision of_____

Have the following work done, and a memorandum of cost (time and materials in separate items) sent to this office.

It should be completed_____

Signed_____

BRADLEY POLYTECHNIC INSTITUTE. DEPARTMENT OF MANUAL ARTS.

SHOP ORDER SHEET.

FIG. 3.

SHOP ORDER NO._____

FOR_____

LABOR:			
Class A, _____ Hours _____			
" B, _____ " _____			
" C, _____ " _____			
" D, _____ " _____			
" E, _____ " _____			
" F, _____ " _____			
" G, _____ " _____			
" H, _____ " _____			
MATERIALS:			
_____			
_____			
_____			
_____			
_____			
_____			
_____			
_____			
OFFICE: _____			
TOTAL _____			

Date of Report_____

Made by _____

BRADLEY POLYTECHNIC INSTITUTE. DEPARTMENT OF MANUAL ARTS.

COST SHEET.

FIG. 4.

books. The original is on a white sheet; the carbon duplicate is on a pink sheet and remains in the order book as an office record.

When the job is completed the teacher sends to the office a cost sheet, Fig. 4. The order number corresponds with the number on the shop order sheet. The labor is classified strictly according to commercial value, or as near to that as the teacher can estimate. Class A represents an expert workman, usually the teacher, working at a machine. Class B represent an expert workman working at the bench. Class C represents

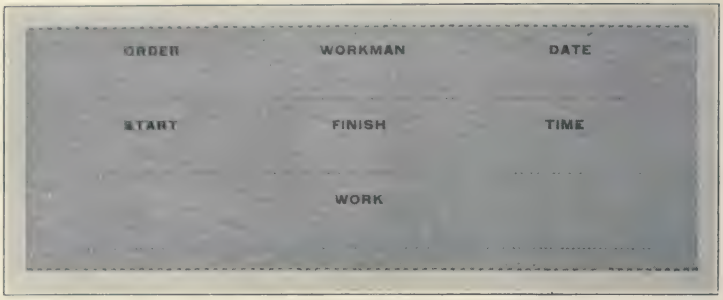


FIG. 5. TIME SLIP.

a good workman—one of the strongest students—and a machine; Class D represents a good workman at the bench. And so the labor is graded down to G and H, which stand for work of the "helper" grade. Each of these grades has a corresponding money value, which is used in completing each labor item on the sheet after it has been sent to the office. Materials are reported in similar detail. These items, added together with any extra office charge, give the total cost of the job. As in many modern factories, these cost items are figured so as to permit of the usual trade discounts.

The time slip used is shown in Fig. 5. This is printed, four on a sheet, with perforations between each. It is essentially a copy of a time slip which has been in successful use for many years in certain woodworking factories in New England. The workman makes out a separate slip for each order worked on during the day, and therefore hands in as many slips each day as he has jobs to work on. The teacher on receiving them merely sees that the total is correct for the day and marks the classification on each slip as C, F, etc. Then he tears the slips apart, if still fastened together, and hangs them on hooks for the purpose, one hook for each order, or he groups them in a drawer or box as seems to him to be convenient. When the job is done he summarizes the slips and

puts the totals on the cost sheet, Fig. 4. This sheet is made in duplicate as was the case with the shop order sheets, so that a carbon copy is kept by the teacher. In this case, however, the original is a yellow sheet and the duplicate a white one. The colors add to the convenience in handling, especially in the Department office. When the system was first started, material slips similar to the time slips were used, but now stock bills made out by the workmen or a sub-foreman or by the teacher, as the case may be, are substituted for these slips in keeping a record of the material for a given job.

The cost sheets in the Department office serve in making out bills, in making financial statements of the shopwork, and in estimating future jobs.

The first shop order issued under this system was on Jan. 16, 1912. Between that date and Sept. 1, 1912, work was completed to the value of about $800. The reports for the next three years give the following figures:

Year ending Sept. 1, 1913	$1,595.11
Year ending Sept. 1, 1914	2,052.81
Year ending Sept. 1, 1915	1,475.11

In making up the above figures a discount was taken off of all items not sold for cash, so that the figures are well within the actual value. Among the products sold for cash were drawing tables for a local public school, rural school benches, playground slide and teeter-totter for a children's home, a variety of furniture, drawing boards, study tables, bench-books, bread rack for a bakery, case of small drawers, stock for school use, etc. For the use of other departments of the Institute there were made a spring board, trestles, bleachers, etc., for the gymnasium; benches and table for the horology school; and tables, bookcases, and chart cases for several other departments. For the Manual Arts Department there has been made a large volume of work, including individual lockers for drawing room, drawing tables, interlocking drawing board cabinets, coat lockers, exhibit frames, foundry equipment, workbenches, tool cabinets, tables, furniture, drawing boards, tee-squares, wood pulleys, and many more.

The man employed as teacher in the factory shop, Henry L. Hurff, had taught very little before taking charge of this shop, but during thirteen years of practical experience he had come in contact with the real problems of carpentry and millwork. He therefore approached the problem from the vocation, and not from the school standpoint. During the

first year he was working under the supervision of a man with many years of experience in teaching manual training classes in woodworking. The aim of both men was first to organize a real producing factory, admitting a comparatively few students, and then, little by little, to solve the problems of giving instruction as they came along in the natural order of development. It took comparatively little time to establish the factory routine, but it has taken much more time to determine the most effective



FIG. 6. WORKING AT THE JOINTER.

organization of subject-matter and the best methods of giving instruction. In making decisions it has been necessary to keep two facts constantly in mind: First, that our aim is to teach and not to make money; and, second, that the factory routine and factory methods of doing work are an essential part of the educational scheme and must therefore be retained. The big problem, then has been, to harmonize the educational aim, namely, to produce intelligent, thoroly trained workmen, and the factory routine, which is intended to produce high-grade manufactured products at a speed that is acceptable in a commercial factory.

After three and one-half years of experimenting the scheme of training, or the course of instruction, may be outlined as follows:

A. Before any student is allowed to use the machines of the shop, or any one machine, a series of demonstrations are given to acquaint the members of the class with the construction and operation of the machines. Minute instruction concerning the positions to be taken in working at each machine is given, and emphasis is placed on precautions to be taken in order to avoid accidents.

B. The first real experience at the machines is in getting out stock and such other rough work as will give experience in the use of the cut-off saw, the jointer, Fig. 6, and the surfacer. The time spent in such work varies, with the student, from ten days, four hours a day, to two months, according to his ability. The average time is about six weeks. During this period it is expected that every student will be taught to measure lumber and identify a few of the common woods, both in the rough and surfaced.

C. As soon as the students have proven their reliability in the rough work they are taken off, one or two at a time, and started on the second type of work. This consists of making three or more joints from models given to the students. From the commercial factory standpoint this work is entirely non-productive, but experiments seem to have proven conclusively that it is really a time saver and a lumber saver. It usually occupies from four to seven days and it prevents wasting many feet of lumber. The joints required of all are (a) a panel joint, (b) glass door joint, or rabbeted mortise-and-tenon joint, and (c) table leg joint. Others that are often added to this list are the sash joint, the table leaf joint (made later in the course when the student is allowed to use the shaper), the stretcher joint, etc. The joints are kept by the students for reference. The experience gained in this type of work seems to be of great value in thinking out the parts of a structure in their relation to each other, and it helps to develop an appreciation of the importance of accuracy in setting the machines.

D. The third type of work consists of small panel doors, glass doors, backs of cases and such other work of about the same grade of difficulty as may be available. Here, as elsewhere thruout the course, the students are promoted individually from one type of work to another, the basis of promotion being dependent on reliability in doing a thoro piece of work in a reasonable length of time, judged by the standard of the commercial factory. During this period each student makes a sketch of the piece



FIG. 7. GLUING UP DOORS.

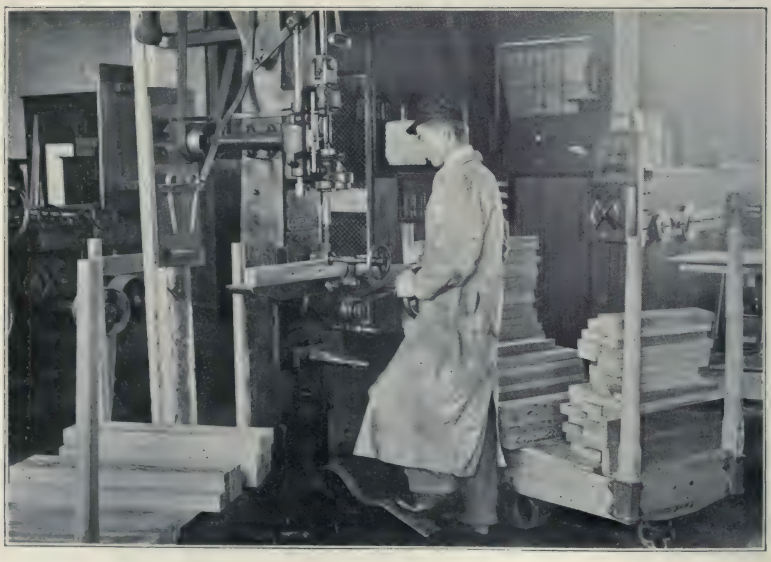


FIG. 8. CUTTING MORTISES.

he is making, and prepares a stock bill. This sketch is often made from a blueprint or drawing of the structure of which he is making a part. Often the problem involves many duplicates, and two or more students work together on a job so as to do the work most efficiently. An example of this way of working is shown in Fig. 7, where one student is gluing up doors and two students are clamping them in a stack. This type of work occupies about one month.



FIG. 9. BREAD RACK FOR A BAKERY.

E. The fourth type of work occupies the remainder of the first year, and consists of construction and assembly work. This often requires one student to make a complete case from beginning to end, or the problems in hand may be such as to require that two or more students work together. Sometimes there are many duplicate parts to be worked, Fig. 8 and Fig. 9, and sometimes there are but few. The student makes a sketch of each part of the structure he is making and puts the working dimensions on it. If a student has special ability he may be given charge of a complex job and sub-divide it, thus laying out work for several students in different stages of skill. The assembling will later be done by the student who laid out the work, acting as a sub-foreman, Fig. 10.

During this period of work students get experience in wood-finishing and are given thoro instruction in proper use of glue, and in the handling of gluing apparatus. They are taught the sharpening and use of the hand scraper; saw-filing is begun. They are also taught the economical use of lumber, which involves maintaining an organized system of caring for and utilizing scrap pieces. Scraps are classified, sometimes by sizes, sometimes by their use.

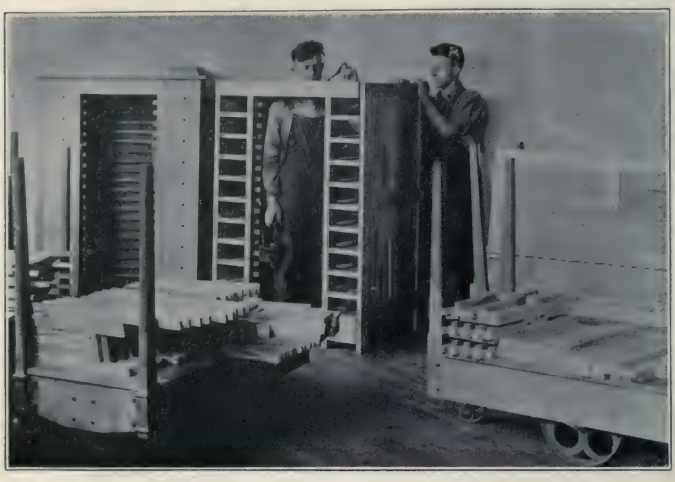


FIG. 10. ASSEMBLING INTERLOCKING DRAWING BOARD CABINETS.

F. The fifth type of work is in many respects a continuation of the fourth, except that the work is done in harder and more valuable woods, requiring more accurate results. Such problems as an oak cabinet or the interior finish and casework for an office belong in this stage. It is in this stage that most of the students hope for an opportunity to act for a while as a sub-foreman. In this stage the most reliable students, and these only, are allowed to run the shaper. It is in this stage also that students who have become especially accurate in their work may be allowed to do such a delicate piece of work as making tee-squares, Fig. 11, one hundred of which have recently been turned out in one lot. All students in this stage are required to make at least one wood pulley, and to get some experience in belting work and the elements of millwrighting. Special jobs involving templet work are included, circular-saw filing and

band-saw filing and brazing are taught, and before the end of the course some problems in estimating are given. Thruout the entire two-year course there are occasional class demonstrations, lectures, and discussions, but in the work at the machines the students are assigned according to individual efficiency and held up to a commercial standard of accuracy, and approximately up to a commercial standard of speed when actually working at the machines.



FIG. 11. TEE-SQUARES—A JOB REQUIRING DELICATE AND ACCURATE WORK.

The result of the three and one-half years of development is very gratifying. While there are many things yet to be learned about the new problems involved in maintaining such a school factory on a sound educational and economic basis, enough has been learned to encourage us to state the following as conclusions:

(1) That school work in a factory shop must be organized with reference to teaching as well as with reference to producing. Such organization is necessary if instruction is to be efficient, and economical of the learner's time.

(2) The non-productive work has a place in the school factory shop—even exercise pieces pure and simple.

(3) That it is practicable, under favorable conditions, to operate a school shop under the factory system, but the factory system should not be allowed to prevent the instructor from stopping the work of any number of sudents at any time to give class or group instruction. The producing purpose of the factory shop must give way to the instruction purpose.

(4) That a school factory shop may be organized in such a way as to be a superior educational workshop, giving the most practical kind of instruction with a high degree of thoroness by methods that are sound pedagogically and that call forth a high type of interest on the part of students.



MEDICINE CABINET DESIGNED AND MADE BY A FIRST-YEAR STUDENT IN THE BOYS' HIGH SCHOOL, READING, PA.

A REPRODUCTION OF AN OLD BLUE COVERLID.

LURENE SEYMOUR.

PATTERNS have been put into woven material in a number of ways but no one of these ways is more interesting than that used in making the old blue coverlids. These were woven on the colonial loom that is now so often found in the attic or the barn, ordinarily using four heddles, and material spun and dyed by members of the family. With such a coverlid at hand, we may reproduce the pattern, provided a loom is available.



FOUR-HEDDLE COLONIAL LOOM.

It is necessary first to block out the pattern as our grandmothers did on four lines representing the four heddles to be used in the weaving. In order to do this, we must know the following principles which underlie all four-heddle weaving:

(1) There are six possible combinations of the heddles: 1-2, 1-3, 1-4, 2-3, 2-4, 3-4.

(2) Of these combinations, 1-3 and 2-4 are always reserved for plain weaving.

(3) 1-2, 1-4, 2-3, 3-4 make the pattern.

(4) The last thread under one block of color is always the first thread under the next block of color.

(5) All blocks in vertical and horizontal lines are made by the same combination of heddles.

(6) There is a row of plain weaving after each row of pattern.

Suppose we consider the pattern diagram—I. We must first pick out of this pattern the unit of design which is repeated backward or over again from the first. This consists of two parts, a square and a circle, and extends from A to B. Some patterns, however, repeat a single unit.

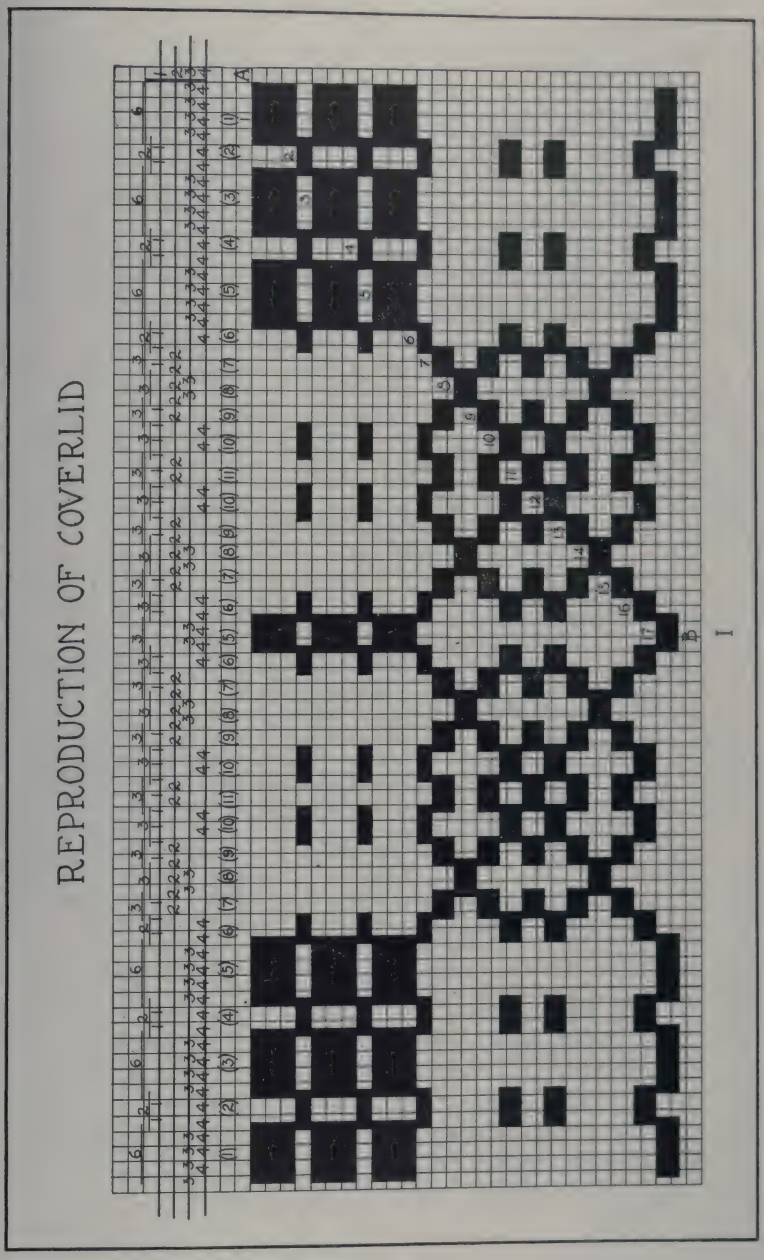
When this is decided, we are ready to represent our blocks of color, beginning at the upper right-hand corner of the unit and working diagonally to the lower left-hand end.

We may choose any one of the four heddle combinations for our first block of color, and we must count the number of warp threads under the block. In this case, there are eight. Suppose we choose the combination 3-4, we then mark alternately on the lines representing the third and fourth heddles, using as many as will correspond to the number of warp threads needed.

According to principle (4), our next combination must be one that has in it the last number just used. In the diagram, the last number was 4, so the combination 1-4 must be used next. This is represented as before on the lines representing those heddles, counting the 4 already there as the first number and using as many, alternately, as there are to be warp threads under the second block of color—in this case, 4.

It is easily seen that the square is simply a repetition of the two blocks so far represented, until there are six, and the inference is that we repeat until we have the required number. Here is the first difficulty: The last heddle used was the first, and our next block, in order to be like the first, must be made with the combination 3-4. In order to have the last thread be the first in the next, 4 must be the last heddle used. We can make this right by adding another thread to the warp threads under the second block and putting it thru the fourth heddle. When we are ready to use 3-4 eight times, using the fourth heddle first. Here again we find we must add another thread to the 3-4 combination in order to use 1-4 next. In this way, we represent our six blocks.

Block 7 is evidently a new combination of heddles since we can find no block of color that is in a horizontal or vertical line with it like one already represented. (Principle (5).) The last heddle used in the sixth block is 1. The new combination to be used is 1-2. (Principle (3).) This block is apparently the same width as the sixth, so we use four threads.


REPRODUCTION OF COVERLID

Block 8 has none in a vertical or horizontal line with it that is like one already represented. We must use an entirely new combination, and 2-3 is the only one left. The last thread of block seven is 2.

Block 9 is in a horizontal and vertical line with 7, so must be made with heddles 1-2. A thread must be added to block 8 in order to allow this combination next. There are 6 warp threads under this block.

Block 10 is like 6, so must be made with heddles 1-4. The last heddle used in 9 is 1. There are 4 threads under this block.

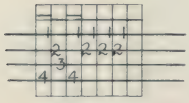
Block 11 is like 9 and 7. The combination to be used is 1-2. The last thread used in 10 is in heddle 4, so one more thread must be added, putting it thru heddle 1. The width is the same as 10.

We can see that block 11 is the middle of the circle. If we repeat backwards thru block 5 what we have already written, we will have reached block 17. This last block, however, must be over 5 threads instead of 9, as in block 5.

If we then repeat backwards from 16 thru 1, we will have the second circle and the corner square.

This pattern may be made larger by repeating the circle more times before adding the square.

The use of the last thread under one block as the first thread under the next block, as set down in principle (4), is to avoid a hole between the blocks of color. I have, however, found in two patterns an exception to this rule. In diagram II, you will see that block 5 is woven with heddles 2-3, while the ones preceding and following are woven with 1-4. I have not yet found this to occur when the row in which that is found is woven more than once at one time. One thread with a row of plain weaving on each side of it will not leave any visible opening.



II

Now that we have the draft of our pattern, the next problem is to put it into the loom. The loom will need to have on it white cotton warp fine enough to make 26 threads to an inch. The width of the warp will depend upon the number of threads needed for the pattern. If this pattern is to be used as drafted, there will need to be 143 threads with 8 additional threads in order to have 4 sets of double threads at each end for strength. There must be four sets of heddles, and these are numbered from the back. The treadles must be tied up to the corresponding heddles, numbering from the right.

The threads will be taken in order as they come from the back of the loom, and put thru the heddles as indicated in the draft, using a double thread the first four times:

Thread 1 thru heddle 3,
Thread 2 thru heddle 4,
Thread 3 thru heddle 3,
Thread 4 thru heddle 4.

Each thread passes by the heddle to which it does not belong and at the left of the preceding thread. The last four threads at the other end are double.

When the pattern is all put in, thread thru the reed and tie to the cloth beam as uniformly tight as possible; mistakes can be detected by trying out the plain weaving. Principle (2) says heddle combinations 1-3 and 2-4 are used for this. If no two successive threads are lowered in one shed, the pattern has been put in properly, and we are ready to begin the weaving. If there is a mistake, the place must be found in the pattern and remedied. Sometimes this can be done by tying in a heald or two, or by dropping out a thread or two. This necessitates changing the threads in the reed. If the mistake is a serious one, the warp may need to be taken out of the heddles from the mistake to one end and put thru again.

For weaving, we will need two shuttles, one of white cotton—like the warp, and one of color, coarser than the warp. In the original coverlids this was of wool, but in the reproduction it is sometimes of cotton about the coarseness of wool.

We will read our pattern from right to left, stepping on the same treadles as are indicated by the heddle combinations. The lines above the draft, overlapping one thread each time, cover the threads that will make one block of color. After each row of color, there must be a row of plain weaving in white, using alternately treadles 1-3 and 2-4. As the treadles are numbered from the right, we can simplify the matter by always using 1-3 when the white shuttle is at the right side of the weaving and 4-2 when it is at the left side. The lines of color are repeated as many times as are necessary to make the block the right depth. The numbers above each combination in the draft indicate that.

Before starting to weave, suppose we write out the order of treading and place it in a convenient place on the loom. Such directions would be in part as follows:

3-4 (6 times)	3-4 (6 times)	1-2 (3 times)
1-4 (2 times)	1-4 (2 times)	1-4 (3 times)
3-4 (6 times)	1-2 (3 times)	1-2 (3 times)
1-4 (2 times)	2-3 (3 times)	1-4 (3 times)

The following will show the way the weaving will proceed:

(1) 3-4 color	(3) 3-4 color	(5) 3-4 color	(1) 1-4 color
1-3 white	1-3 white	1-3 white	1-3 white
(2) 3-4 color	(4) 3-4 color	(6) 3-4 color	(2) 1-4 color
2-4 white	2-4 white	2-4 white	2-4 white

At the end of each colored row, the white and color must be twisted so that the color will not pull back when repeated so many times.

I presume very few would wish to undertake a coverlid, but if there is an interesting one in the family, a pillow cover, tray runner, workbag, or pincushion of similar pattern will add to the effect of the room in which the coverlid is used.



MADE BY HIGH SCHOOL STUDENT, PORTLAND, OREGON.

A LEVELING JACK WITH INSTRUCTIONS FOR MAKING.

FREDERIC H. M. DUNSEITH.

A LEVELING jack is a small tool used on the milling machine and planer to take up the spring of the work, or support work that has an irregular outline, or to support work that hangs out from an angle plate. It is a very handy tool and affords a good problem in the machine shop work for boys. The one presented here, Fig. 1, can be made in a small lathe equipped with a lead screw and gears for thread cutting. The greatest difficulty in doing the work on this jack will be met in cutting the thread on the screw.

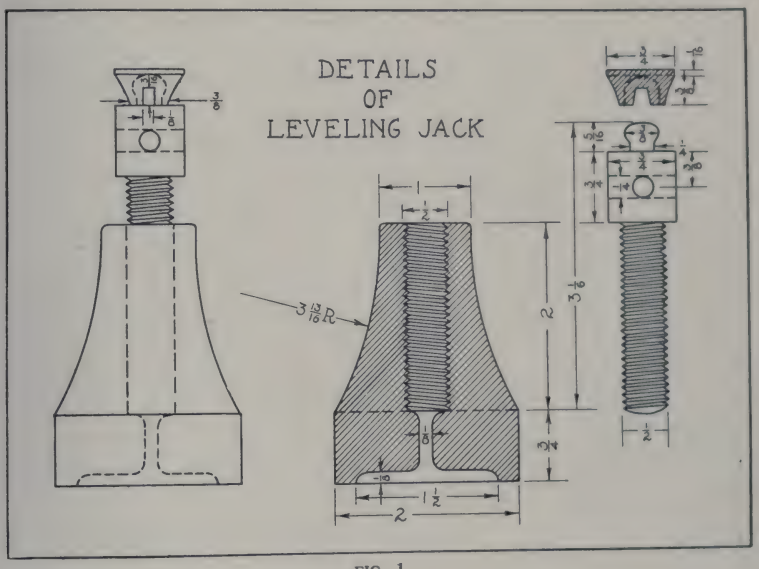


FIG. 1.

The first thing to do is to make a pattern for the base. When doing this an allowance of ⅛″ should be allowed on the diameters for finish, and 1″ added to the length at the small end to carry the dog while the piece is being turned. The pattern is made solid, since it can be cast on end. A casting will cost only a few cents.

The first operation on the casting of the base is the centering of it. Take a combination square, and with the centering head against the side of the casting, draw two lines at right angles to each other. Where

these two lines intersect put a prick punch mark. Do the same on the other end. Take a combination center reamer and drill, and drill the center holes. (A combination center reamer and drill is a small tool which drills the hole in the center and reams it out to the proper angle at the same time. This angle is 60°.) When drilling the centers, care should be exercised in not drilling the hole deeper than the taper on the reamer. With a dog placed on the large end, the work is now ready to be placed in the lathe and turned. Before screwing up the dead center place a few drops of oil in the center hole, and take care that the center is not tightened too much for as the work is turned, the heat that is generated causes the work to expand, and might heat the center enough to burn it. The work should turn freely on the centers without any end motion. With the work thus set between the centers, take a diamond-point tool and set it so that the cutting edge is just above the center. The point of the tool should be a little rounded, at least so that it is wider than the width of the feed. This will prevent the tool cutting threads of the work and will leave the work smooth. The depth of cut and feed will depend upon the machine, and the operator must use his own judgment. For ordinary carbon steel the cutting speed for cast iron should be about 40 feet per minute.



FIG. 2.

The cutting of the piece may be done in the following order. First turn the small end back a distance of 1″ and to a diameter of 1″, which will be the proper size. Change the dog from the large end to the small end and turn the large end to size. But before turning the piece to diameter first face off the end square and to proper length with a side tool. (This length is $2\frac{3}{4}''+1''$.) Set the side tool so that the cutting edge will be on a line with the center of the lathe, and at a slight angle with the face of the work. After this end is turned to size take the side tool and with the sharp point scribe a line around the base $\frac{3}{4}''$ from the end to mark the beginning of the curve. Do the same on the other end 1″ in from the end. In order to have the curve uniform make a template of thin wood or metal corresponding to the proper curve, Fig. 2.

The turning of the curve is not a very difficult job. The best method is to rough it out by moving the tool and carriage by hand, and then finishing it up in a speed lathe. But if a speed lathe is not avail-

able, it can be done in an engine lathe by simply throwing out the back gears and running direct, using the tool in the tool post as a rest for the hand tool. Work the hand tool back and forth until the curve fits the template. When using the hand tool care must be taken that the tool does not dig into the piece and cause ridges. After the curve is finished to template use a little emery cloth and polish the whole piece.



FIG. 3.

Drilling the hole in the base for the screw is the next operation. The hole that is drilled must be of such a size that there will be enough metal left to cut a thread to lift a screw, the outside diameter of which is ½". Therefore a smaller drill than ½" must be used. The size of the drill to use is $\frac{13}{32}$". Since the casting is now 1" longer than the finish length, the hole will have to be drilled 3" deep. The reason for drilling the hole before the extra inch is cut off is to use the center hole as a guide for the drill. If this were not done it would be a rather hard job to locate the center exactly. Drill a ⅛" hole through the bottom to allow the dirt and chips to work out when tapping it.

Use a ½"-13 threads tap and pay attention to the position of the tap when starting it into the hole. The tap must be started straight, or before it reaches the bottom it is apt to bind on the side of the hole and break the tap. There are three taps to a set—taper, plug, bottom. They are all used in tapping a hole, and in the order named.

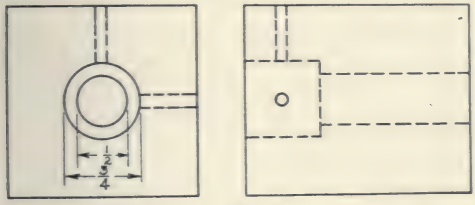


FIG. 4.

The base is now finished except to cut off the extra material on the small end, which can be done by placing the base in a chuck, or if a chuck is not available, it can be sawed off with a hacksaw.

The next part to make is the screw. Take a piece of machinery steel or cold rolled ⅞" in diameter and 3¼" long and center and turn it down to the dimensions given for the proper length. The ends should be just square so that there will be enough metal left to allow the center at the knob end to be turned off.

Get a tool, and grind it so that the angle between the cutting edges will be 60°, which can best be done by fitting it to a thread gage, Fig. 3. The tool should be set in the lathe so that the top of the cutting edge is on a level with the center of the lathe. Having set the tool, the

next problem is to find the gears necessary to cut 13 threads to the inch. The gears that are furnished with a lathe vary by some common difference, such as 4 or 5. That is, if the smallest gear is 20 the next is 24, and so on.

To find the size of gears to cut any pitch of thread, form a fraction the numerator of which is the pitch of the lead screw, and the denominator of which is the pitch of the screw to be cut. Multiply both terms of the fraction by the common difference in the gears and the terms of the new fraction thus formed represent the gears to use. The numerator will be the gear to use on the stud and the denominator the gear to use on the lead screw.

$$\frac{\text{Pitch of lead screw} \times \text{common difference}}{\text{Pitch of screw to be cut} \times \text{common difference}} = \frac{\text{stud gear}}{\text{screw gear}}$$

To cut the thread, first clamp the split nut on the lead screw. This should not be opened until the screw is finished unless there is an indicator on the carriage to indicate the point at which to throw it in. If the lathe is not fitted with a micrometer feed there is a screw and stop by which the depth of cut may be measured. Avoid taking deep cuts. It is safer to take light cuts and go over the work more times rather than to take heavy cuts and run the risk of stripping the threads. After the cut has run to the shoulder draw the tool away from the work and reverse the machine, and let the tool run back to the beginning of the cut. Repeat this operation until the threads fit the thread in the base. Why must the tool be withdrawn before the machine is reversed? Mark this! the tail of the dog must be put in the same slot of the face-plate after each time it is removed or the threads will be spoiled. Beginners often spoil their work by failing to do this.

The small holes in the screw can be drilled sufficiently accurate by means of a little jig, Fig. 4. Take a square block of hard wood, and drill a small hole on two sides in the center between the edges, and $\frac{3}{8}''$ from the face. Bore a hole through the center the size of the screw and enlarge this hole to $\frac{3}{4}''$ for the head. By placing the screw in this little jig the holes can be located and then drilled thru by holding the screw in a block.

If there is no chuck available the part for the knob may be turned to size between centers, using a narrow tool to gouge out the smallest diameter, and finally filing the top to finish. The cap can be purchased in any hardware store, or if one so desires he may make one, according to the dimensions given.

MANUAL TRAINING AND DOMESTIC SCIENCE IN THE RURAL DEMONSTRATION SCHOOLS OF THE IOWA STATE TEACHERS COLLEGE.

H. J. Whitacre.

IT is a pertinent fact that the rural school of America is far behind its city cousin. Strange as the fact may seem, it is only within recent years that the search-light of efficiency has been turned upon this almost sacred American institution. Several years ago President Seerley pointed out in his book, "The Country School," the need of rural demonstration schools in Iowa. Acting upon the recommendations so wisely set forth in that book, the Department of Rural Education of the Iowa State Teachers College organized in the spring of 1914 the first rural demonstration school. Since that time eight such schools have been added.

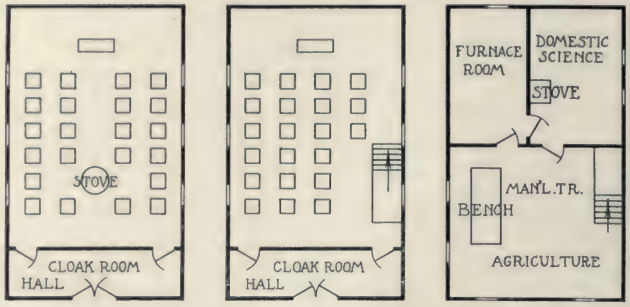
The purpose of these schools is: (1) To demonstrate objectively the possible efficiency of the one-room country school; (2) To show how it can be made to minister to the needs of the community which it serves, without unreasonable expense; (3) To serve as a laboratory in which some of the vexing problems of rural education in Iowa may be worked out to a logical conclusion; (4) To serve as training schools for students of rural education.

These are in no sense model schools for exhibition purposes. They simply represent what may be accomplished in any rural community. The schools are under the control of the regularly elected boards and have the ordinary legal relationships to the county superintendent and other school officers. In order to secure the necessary cooperation, they are under the supervision of the Department of Rural Education, but the college has only a supervisory relationship. The teachers are hired by the district, in the main, a small share being paid by the state. As there is no written contract, this agreement may be discontinued at any time at the will of either party. The equipment of these schools is simple and inexpensive, as it is the aim of the department to keep expenses of equipment and maintenance within the financial limits imposed by the restricted supply of funds usually available for the support of country schools.

The Benson school offers a striking example of improvements which may be made to old buildings, in order to make them up to date. Here,

during the past summer, the schoolhouse was raised, a basement excavated under it, and rooms for fuel, furnace, and manual training provided.

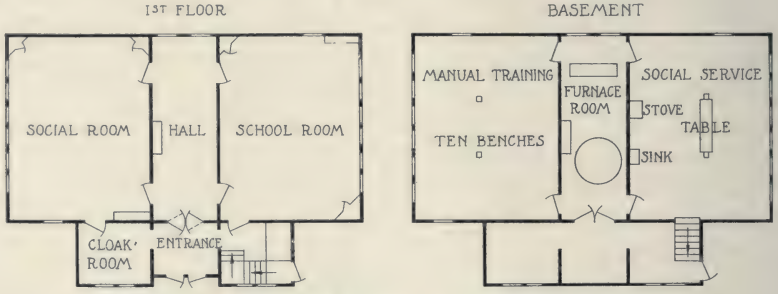
The Cedar Heights school is probably the best rural school building in the state. It has in the basement a furnace room, a manual training



PLAN OF BENSON SCHOOL BUILDING.
A AND B—FIRST FLOOR BEFORE AND AFTER REMODELING. C—BASEMENT.

room, and a social service room. The workbench for this school was loaned by one of the boys in the district.

In district No. 9 space was at a premium; the bench was fastened to the wall with hinges, so that it might be lowered for use.



BASEMENT AND FIRST FLOOR PLANS OF CEDAR HEIGHTS BUILDING.

The special equipment provided is purposely as simple and inexpensive as possible. For the primary grades, scissors, rulers, reed, and raffia are provided. The projects consist of freehand paper cutting to illustrate stories; as, for instance, the children of the first grade made booklets in which they pasted cuttings to illustrate Longfellow's poem, "Hiawatha." The children make raffia and reed mats, baskets, trays, etc.

The equipment for woodworking varies to some extent in the different schools. The benches are of three different types. A few of the schools have benches purchased from the manufacturers. Some have benches such as are commonly used by carpenters, having con-

tinuous-screw vises. Still others have benches made by the boys. It might be remarked that this sort of bench makes an excellent beginning exercise for the older boys, as it involves only the simpler operations. Some schools which must economize space, have benches hinged to the wall and supported on hinged legs. This type of bench is folded up when not in use and is very serviceable for schools which are close-pressed for room.

No expensive equipment of tools is tolerated. Only such tools are used as are found on most farms. The set usually consists of one or two jack-planes, try-square, ruler, nails, gages, compasses, crosscut and rip saws, a brace and bits, rasps, and a sharpening stone. The average cost of the equipment in these schools is about $6. The material used for most lessons is found in boxes around the home.

As to courses of study and projects, there are no hard-and-fast rules. The Department of Public Instruction has issued a bulletin illustrating a large number of projects suitable for rural schools. This is in the hands of all rural school teachers.

Some of the problems are: nail boxes, feed hoppers, bird houses, corn test trays, knife-and-fork boxes, sand tables for schools, and fly-traps. Special emphasis is placed upon repair work, as this is where the farmer boy can best use his knowledge of tools.

Instruction in the household arts for the girls is confined to every-day problems in household management, home decoration, and sewing. Only such phases are studied as will apply with especial force to the problems confronted by the woman on the farm. Instruction is made as practical as possible, and is prevocational in nature.

Following is an outline of the work, as given in one school last year, which illustrates the general type of work undertaken:

Home Sanitation:

1. Importance of fresh air.
2. Use of soap and cleansers of all kinds.
3. Dust and its effect.
4. Care of milk.

Home Decoration:

1. Harmony of colors, walls, floors, furniture.
2. Selection of furniture.
3. Arrangement of furniture.

Home Management:

1. Planning of work.
2. Dish washing.
3. Table setting.
4. Sweeping and dusting.

In sewing much stress is placed upon the making of common things that are used about every home, simple sewing which every girl should know how to do. These lessons include the exercises on the various stitches, the making of button holes, patching and darning. When the children can accomplish the exercises well, articles such as aprons, towels, dust caps, hem-stitched handkerchiefs, sheets, house dresses, and work aprons are made.

While at first thought it might seem well nigh impossible for manual training and domestic science to be taught with any degree of efficiency in the rural schools, yet the work of these demonstration schools, these laboratories, points conclusively to the fact that these newer subjects should constitute a very vital part of the instruction. These demonstration schools and the work they are doing are simply another instance of the awakening along educational lines, of which we have as yet experienced only the beginning.



VICTROLA CABINET MADE BY STUDENT IN HIS SPARE TIME IN THE MCKINLEY MANUAL TRAINING SCHOOL, WASHINGTON, D. C.

THE EDUCATIONAL SURVEY OF CLEVELAND—II.

W. E. Roberts.

THE first three sections of the Educational Survey of Cleveland were summarized in the February number of this Magazine. Four additional sections have since been given to the public.

FINANCING THE PUBLIC SCHOOLS.

EARLE CLARK.

This section of the report deals with expenditures and receipts of the Cleveland Board of Education covering the period from 1902 to 1914, and discusses the adequacy of expenditures in detail, basing the discussion upon population, wealth, and the average daily attendance of the child, comparing Cleveland with seventeen other cities of approximately the same population. Comparisons show Cleveland to be high in expenditures for business purposes and low in expenditures for educational purposes, such as salaries of educational officials and teachers, and educational supplies.

A large portion of the section is devoted to the administration of the finances and to the income of the Board of Education. A number of economies are suggested, including the introduction of the platoon system, making possible a more continuous use of schoolroom space, a simpler and more uniform system of accounting, legislation making more elastic the transfer of monies between departments, the provision of more adequate funds from taxation, savings in interest, and a more complete school enumeration providing larger revenue.

The report is made very concrete by many illuminating tables and diagrams.

EDUCATION THROUGH RECREATION.

GEORGE E. JOHNSON.

This subject is closely akin to industrial or occupational work in the schools, in many instances reaching over into the field of construction activities. It offers much that is suggestive to the manual training worker. The section has been characterized as a picture, a program, and a prophecy. It deals fully and concretely with the present in Cleveland and suggests unlimited educational possibilities for the future.

Cleveland has a larger program and a better equipment for recreational work than is usual elsewhere. The criticism is that facilities are not sufficiently used: recess periods are not organized, playgrounds are idle a large proportion of the time and equipments are often stored except in the summer. Gymnasiums and swimming pools are unequipped or unfinished. More or less formal gymnastics and games and the substitution of athletic tests for vigorous games in the elementary schools are questioned.

Commendation is given to the organization and conduct of summer playgrounds, and attention is called to the division of "schoolroom and indoor recreation" for primary grades as a feature unique in school organization.

Hardy athletic games are advocated for the elementary schools because adolescent needs and interests are even greater here than in the high schools, because no other agencies exist for organizing games for elementary school children and because the majority of children never reach high school.

Inter-scholastic games are shown to be of value and objections to them without serious foundation. A large place in the report is given to an analysis of the play and recreational interests of Cleveland children. An interesting play census of pupils shows that a large percentage of children is found in undesirable places, and in inconsequential or decidedly objectionable play, if playing at all. That better playgrounds and trained leaders are needed is the conclusion. These analyses are illuminated by suggestive charts and diagrams.

The social value of recreation, the gang instinct, nature interests, nurture interests, educational value of outdoor life, dramatic interests, constructive interests, and music interests are discussed in relation to recreation and education. Constructive work, if given an emotional background, becomes play, no matter how laborious the task.

Inadequate educational influence outside of schools is a general commentary on the failure of public school systems to recognize external educational factors rather than a criticism of Cleveland. Boys and girls must be influenced in out-of-school activities, even to the extent of a lengthened school day. In discussing play as a method, the writer admits there is much uncertainty as to what should be done beyond the kindergarten, altho knowledge demands that we do much more than we are now doing. Interests, activities, achievements are inherent predispositions of the child and the race, and they precede subject-matter. Play

precedes work. "The problem of play versus work in education is to find the basis for emotional background in the activities."

A reorganization for more efficient administration of play and recreation is outlined. The report suggests how to put education into play as well as play into education. It is an excellent model for the gathering of data relative to child activities.

EDUCATIONAL EXTENSION.

CLARENCE ARTHUR PERRY.

In striking contrast with the school of past generations is the school of today. The school of the past was supplemental to social life. The ideal school of today includes social life, expressed in terms of school dispensaries, gymnasiums, showers, clubs, forums, shops, kitchens, lunchrooms, apartments, gardens. More significant still is the recognition of the fact that the school is constantly changing. Social welfare is becoming more and more a school function, not because various social activities are not and cannot be taught outside of school, but because changing social conditions make it possible for the schools to teach them better. Training in citizenship is demanded of the schools. As all of the people assume a larger share in the government, they must be trained in the knowledge of civic responsibility. Benefits and social position not otherwise attainable are required of the schools. Economic reasons are found in the movement for industrial education. It is the business of the schools to give the child something more than facts from books. Efficiency is demanding that the school product succeed in citizenship, and all activities that lead to this end come within the province of the schools. Measures must be taken to overcome wrong influences of the home and the street by setting in motion educational and social influences that shall not only occupy the time and energies of youth, but shall mould and develop civically and socially the adult community as well.

The report deals somewhat fully with activities and forces designed to bring about desired results. It finds Cleveland schools more than usually well equipped for this work, but capable of much further utilization. Concrete illustration of many of the changes advocated by the report is found in the social center work of Eagle School, the activities of which are presented at length. A new era in social work has been inaugurated in the recent establishment of a Division of School Extension and a new development is predicted for social work in Cleveland schools.

SCHOOL BUILDINGS AND EQUIPMENT.

LEONARD P. AYRES AND MAY AYRES.

This section of the Survey report will be of interest to school officials and school architects and engineers. It treats of advancing standards in schoolhouse construction, development thru different decades, conditions of the school plant, safety and sanitation, costs and building problems.

The building policy in Cleveland has been shaped by requirements of education, economy, health, and happiness, and these in themselves represent an evolution in the development of school buildings. The section is an interesting historical study of the development of a school building policy.



VIEW IN SHEET-METAL SHOP, CARNEGIE SCHOOL OF TECHNOLOGY, PITTSBURGH, PA.

EDITORIAL COMMENT

FROM the standpoint of manual training the Minneapolis Convention of the National Society for the Promotion of Industrial Education was, perhaps, the most important and the most encouraging which the Society has ever held. The reason is that a definite and commendatory pronouncement was made regarding the much-debated question as to whether manual training is or is not a significant factor in the industrial education problem.

It must be confessed that the Society has followed rather closely the lead of the Douglass Commission of Massachusetts, and has often affirmed that manual training failed to fulfill its original mission and was without value in the field of industrial education.

The findings of the Minneapolis Survey, and the discussions at the convention, left no room for doubt that the Society now recognizes the important contribution which the manual arts courses in the high school may make directly to genuine industrial training.

Furthermore, the Society has taken pains to point out just what changes should be made in the high school courses in order to render them vocationally effective. This portion of the Minneapolis Survey should be read carefully by every teacher and director of manual training in the country.

THE impression left on the mind of the educator attending the convention in Minneapolis, was that any system of industrial education must grow out of the general education directly preceding it, and that one important duty of the promoter of special training was to influence for good the public school system as a whole. The problem which, apparently, seemed relatively simple to the Society six or seven years ago, has grown steadily in complexity until now it is quite clearly recognized that it will take *all* agencies working together to work out even a partial solution.

Not only are educators now welcomed to take part in the councils of the Society, together with the employing interests, but organized labor is coming to assume a more important position. To be sure, at other meetings of the Society, representatives of organized labor have presented prepared papers on the relation of industrial education to organized labor, but at this meeting informal discussion from the floor, and the questioning of speakers in regard to their attitude toward labor prob-

lems, revealed the possibility of a militant activity on the part of the unions unless labor is fairly represented in all industrial education plans.

If there was less of "lofty idealism" in the papers presented, there was more of "practical idealism." More clearly than at any previous meeting of the Society the demands for improvement were based on a frank recognition of such trade and educational limitations as can not be changed either radically or quickly.

Nowhere was this recognition manifested more surely than in the discussion of trade agreements. Intelligent, workable programs were laid out and if these agreements, or similar ones, can be put into actual practice, the Minneapolis convention will have set a new mile-stone in the progress of industrial education. The proposed agreements are drawn up with due regard to the industry, the school, and the youth, and all three will be immensely benefited if the agreements can be put into actual and successful operation.

THERE appeared at several meetings direct evidence that scientific knowledge is to be sought in the solution of industrial education problems. Questions regarding supply and demand in the labor market are not to be ansewered by prejudice against labor or prejudice against capital. Sociology, economics, and psychology were brought into the discussions to help clarify a situation which has been obscured too often by the statement of mere opinions, fears, or desires. Here, as elsewhere, science is destined to play a part.

ONE caution should be given. Some may be inclined to infer that the Minneapolis plan of reorganizing the public school system, in response to the demand for industrial education, is the best or the only way. The program, as revealed in the recommendations, is indeed an excellent one, but it should be remembered that, in Minneapolis, the Dunwoody Institute stands ready to help the public school.

For Minneapolis to fail to take advantage of that generous endowment would be criminal in view of the needs of the youth of that city. But for other cities whose youths are equally in need of such training, to neglect to provide, thru the medium of the regular public school, some equally adequate training, would also be criminal. Other cities, failing private endowment, should not be content merely to follow the public school program as laid down in the Survey.

"PREVOCATIONAL."

AT the present time the term "prevocational training" seems to be very widely accepted. It is a term which is sweeping the country and is being applied to any type of work ranging from manual training to trade preparatory work. The prefix "pre" means "before" and so, strictly speaking, the words "prevocational training" mean training before the vocation. That is, a school which trains boys for a trade would be a before-entering-a-vocation school. It is not clear how it is possible, if one follows the meaning of words in making up definitions—and what other way is possible?—to call a "trying-out school" a "prevocational school." A number of persons talking about this matter at the recent convention in Minneapolis felt that the use of the word "prevocational" is unfortunate. One of the speakers suggested "predeterminate" as being more appropriate than "prevocational." This phrase, as he stated at the time, is awkward and has only the advantage of being accurate.

There are several ways of looking at this important question—not alone the question of right terminology for the work, but also the question of the right work for the terminology adopted. Briefly there are the following types of work over which there is considerable confusion of thought and purpose:

1. Industrial and household arts, given about three to seven and one-half hours a week to children who are twelve to fourteen years of age, for the purpose of introducing wholesome and necessary activity work in connection with general education suitable to the adolescent.

2. Industrial and household arts, given about seven and one-half to fifteen hours a week to children who are twelve to fourteen years of age, in varied expressions covering elements of several occupations for the purpose of trying out the capacity and interest of children who must either (a) leave school and go to work at fourteen with some knowledge based upon trying out courses of the vocation they have chosen or (b) continue in a higher school the study of one vocation which they have tried out in the twelve-to-fourteen-year-old period.

3. Industrial and household arts in the junior high school on the 6-3-3 plan.

It has been suggested, that when cities establish courses in industrial or household arts which express themselves thru varied activities and for a limited length of time in each activity in order that pupils may

determine what line of work they wish to follow and what type of school they wish later to attend in order to fit themselves for the vocation about which they have studied something, that these courses or schools be called "trying-out courses." It is a term which the public and the average run teachers will easily understand.

This Magazine will welcome a discussion on the part of its readers of this important topic and seeks illustrated and descriptive articles which cover the above-mentioned expressions of activity work of the twelve-to of teachers will easily understand.



OF CURRENT INTEREST

THE MINNEAPOLIS MEETING.

THE ninth annual convention of the National Society for the Promotion of Industrial Education was held in Minneapolis from January 20th to 22nd, and was quite generally looked upon as one of the best meetings in the history of the Society. From the first session the interest in the program was keen, not only on the part of the members of the Society, but of citizens of Minneapolis. The vital fact behind all this interest was the Minneapolis Survey conducted by the Society under the direction of Dr. C. A. Prosser, of Dunwoody Institute, Minneapolis, and it is a notable fact that the report of the Survey, a volume of seven hundred pages, was printed and distributed among the members several days before the convention. This alone speaks for the thoro preparation that had been made for the meeting.

During the convention a general spirit of harmony of purpose and open-mindedness seemed to prevail, yet many different points of view were presented with vigor. Speaking from the standpoint of the nation, the president of the Society, William C. Redfield, national Secretary of Commerce, referred to the American people as a nation "fed with too much altruism and satisfied with its own morality, to the extent of missing the stern realities of life." He contrasted this with the conditions prevailing in Europe at the present time, and referred to the white light of war thrown on our national effectiveness as revealing our weaknesses, not only for war, but for times of peace. He spoke of the purpose of the convention as an effort to free labor of waste, to dignify labor, and to assure to every child a fair start in life. We must teach our children the "laws of work and how to obey them," not for loss of human happiness, but for its gain. From such training would come the best preparedness, for peace and for war. The trained producer is the best citizen. Dr. George E. Vincent, president of the University of Minnesota, speaking also from the national standpoint, emphasized the same thought when he said: "What a provincial, lazy, fortuitous, self-satisfied people we are, failing to wake up to the golden opportunities that are ours. Both speakers praised the efforts of the educators in promoting the industrial educational surveys, as attempts to work out a definite scheme along which progress toward greater happiness thru greater efficiency may be secured for the greatest number.

One of the stirring addresses of the convention was made by W. F.

Webster, principal of the East High School, Minneapolis. He had been asked to sum up the discussions on the Survey at one of the sessions, and took the opportunity to utter words of warning from the schoolmaster standpoint. He first spoke of the Survey and its finding and recommendations as a tremendous contribution to an educational program for Minneapolis. "Here at last," said Mr. Webster, "is a guidebook, showing the way about in this tangled town, pointing out the pitfalls of business and industry no less carefully than the splendid opportunities." Referring to the details of the report he said that for the better education of the children of the city, no other recommendation approached in importance the one advocating the establishment of intermediate schools. "For that great body of youth, straining at the law's leash until they are freed at sixteen, rushing into life in ignorance of life's demands, the need of a school offering chances to try many varieties of work cannot be too loudly proclaimed."

Then followed his warning:

> If the general scheme could be realized, the 6,000 recruits who enter the ranks of business and industry each year would come well-drilled, ready for the long battle. Minneapolis with such an army might become the ideal city, industrially, culturally—a place of beauty, the metropolis of the Middle West.
>
> Yet this dream may not come true. It may be that a nation can never grow rich merely by making money. Today a congressman hardly dares to express his conviction on suffrage or prohibition until his straining ears have caught a word from "labor." It may be said without chance of error that in another 20 years workers will realize their power and dictate the financial policies of the country. But what will those rulers be? Just what the schools make them.
>
> Nail over the door of every school a placard announcing that the first aim of education is to get money; tell this to 20,000,000 children day after day for 20 years, and can you fancy the result? Selfishness and greed are the sure fruits of such a philosophy. Selfishness leads only toward hate; and the end of hate is destruction.
>
> Any education which whispers ever in the ear of youth, "Put money in thy purse," is an education for savages. Fangs will grow whiter, nails will grow sharper. Today workers distrust the capitalistic crowd, for capital has been a glutton, fattening on the fruits of labor. Injustice and dependence have been the lot of toilers through all the long years.
>
> Society is divided into bitter classes, fighting for their life. And when the day comes in which labor fills the halls of legislatures, as surely it will, no one need be shocked if harshness and cruelty characterize their acts. For labor has been shown the way. But industrial supremacy is impossible for a people divided by hate. Nor will the command of the world's markets be ours until the sign of the dollar has been erased from our courses of study.
>
> We shall give vocational education, not less but more, to the worker in wood and metals no less than to the laborer among books. We shall fulfill

America's guaranty to every child—equal opportunity and a fair start. Yet education is not complete which gives man skill and does not teach him that the laborer is worthy of his hire, that no man is a slave, that it is every man's duty to execute justice and his right to demand justice.

Then looking to the lengthened hours of leisure, education must open the soul to beauty in sound, in color, in thought; to beauty in behavior—bravery, courtesy, honor, kindness; to beauty in earth and sea and sky, and in the heart of man. At all times we shall urge youth to deal fairly, to speak truth, to honor our flag and our country. True education must give back to this nation not only man doing, but man thinking, man enjoying confident, honest kind.

At another session, Dr. David Snedden, commissioner of education in Massachusetts, again presented his wellknown fears concerning the confusing of vocational and cultural aims and methods in education.

It may be safely predicted that by 1925 the very great differences between sound general education and effective vocational education, as to purpose, materials and methods of instruction, will be so well defined in the public mind that the academic schoolmaster will not be able, as he is now able, to beguile and deceive the public as to what he is intending and doing.

In no respect do the traditions of general or academic education persist longer than in relating general or liberal education to vocational education.

MANUAL TRAINING SURVEYED IN MINNEAPOLIS.

A feature of the Minneapolis Survey was the attention given to manual training. This is all the more noticeable because of the manifest lack of interest in the subject that has been shown by the National Society on previous occasions. This change comes in part, no doubt, because of the important place now being given to the discussion of prevocational training, but chiefly because Minneapolis is a western instead of an eastern city. In discussing this part of the Survey, W. J. Bogan, principal of the Lane Technical High School, Chicago, took up the recommendations of the special committee on manual training and discussed them as follows:

The sacredness of secondary school and college requirements should not be permitted to nullify this recommendation. The worship of the three R's might even be abandoned for a time without serious danger of hell fire; for experience has proved time and again that a broad extension of manual activities inevitably leads to increased intellectual

(1) The elementary schools should be so organized as to offer a wider variety of manual activities for all children.

power if the manual work is planned in wisdom. Many educators believe that the time now spent on formal lessons of the traditional type is usually too long for good results. The ignorant parent who was corrected by the teacher for reversing cause and effect in his statement "My boy is stupid 'cause he went to school so long," may have been a subtle humorist. We who believe in manual activities should have the courage of our convictions. We should insist upon a wider variety of activities and a greater allotment of time for these activities on the program of studies.

(2) In the upper grades of the elementary schools prevocational courses should furnish to pupils who desire them opportunities to gain definite knowledge about any specific practice in several of the most important industrial and commercial arts in order to (a) interest and hold motorminded children; (b) furnish new avenues of expression in learning and doing; (c) aid in proper training in book subjects; and (d) help young people to select the kind of training and the kind of occupation they desire to follow.

This recommendation, though very mild in the opinion of the committee, will be attacked by every conservative in the land who is interested enough to read it. There is nothing new in it, but the man who regards our elementary system of eight grades as part of the constitution of the United States will object to what he calls "specialization for infants." You may show him that many of the infants are husky young men or buxom young women at fifteen or sixteen; you may bring statistics to prove that this so-called specialization is the only thing that will hold these infants in the school long enough to obtain a knowledge of the three R's; but you will never rid him of his horror of that word "specialization." This fear may mellow with age until it takes on the dignity of an old superstition; but tho you may convince his intellect you will never completely prevent the recurrence of his old time emotional reaction. Nevertheless, the committee feels that the differentiation of courses suggested for the upper grades is necessary.

(3) The intermediate school or junior high school is one of the best administrative agencies yet devised for meeting the need of training in the manual and industrial arts for adolescent boys and girls. The training in each of these arts should be varied in kind and grade but should be sufficiently constant for a considerable time to meet the varying interests and requirements of different groups. This training should enable individual pupils to select the kind of work for which they are best adapted.

The junior high school is not an educational plaything. It meets a serious need in our public school system. It falls short of perfection,

but it has great possibilities for good. There is some danger, however, that here and there it may become a fetish, for educators frequently seek new gods to worship. There is danger from the man who wishes to secure and hold the spot light. We should beware of the man who wishes to appear progressive to his constituents. By organizing a junior high school without investigation, without good teachers, and without definite aim, the movement which now promises so much good will be seriously retarded. A model school in Minneapolis would do much good, not only for this city, but for other cities.

(4) Short courses meeting the vocational needs of different groups should be offered in the high schools and these courses should be open to all graduates of the elementary schools who wish specific vocational training, either at the beginning of a high school career or at any time during the high school years, when the pupil seeks more direct preparation for a vocation. This could be accomplished, in part at least, by admitting pupils of the early high school years who desire it, to shop courses of the high schools now reserved for pupils of the late high school years.

Variety and flexibility of courses is the keynote of this recommendation. The school is for the pupil. The course should be manipulated to fit the pupil. The pupil should not be bent or broken to fit the course. The soundness of this recommendation is proved every day in schools where "motor-minded" boys in seventh grade are working side by side in the machine shop with boys in the eighth grade. The visitor can rarely distinguish one from another. These pupils of seventh and eighth grades have been called dull. Beware of the "dull" pupil. He may return in after years to taunt you with his success. One of the most serious reflections on our school methods is made by the dull boy who finds it easier than the valedictorian to cope with "the world, the flesh, and the Devil." If, with his lower intellectual standards, this boy can take from an unwilling world a good living, the educator should make a new appraisement of aims and methods. The bad boy under the influence of modern educational methods has gone the way of the dodo. He is extinct. Who knows but what modern methods may in time eliminate even the dull boy? Dullness, like badness, is in many cases due to false standards of measurement. A revision of standards may mean the salvation of souls.

(5) The four-year technical course already approved by the Minneapolis Board of Education, the aim of which is to give boys seeking advantageous entrance to industry on its business and directive side technical preparation in addition to a good high school education, is especially to be commended.

This course can not be made efficient unless the school day is at least six hours long. Seven would be better. School boards and superintendents thruout the country have run from this problem like skittish horses. It ought to be faced boldly. The academic objectors ought to know that vocational education demands special treatment. More important than all else in such a school is the atmosphere of industry. The classicist who looks with contempt on vocational education should be prohibited from teaching vocational pupils. If Minneapolis makes no provision to train vocational teachers with a belief and a pride in their work, this Survey will have failed in its purpose. Only a small percentage of the teachers who have had the benefits of the old education can adapt themselves to the new. Many have sympathy but few have the right point of view.

(6) To be successful, any vocational course must have the hearty support and cooperation of all interested in the vocations concerned, and, to meet the requirements of any vocation, must have information and advice which only those in the vocation itself can give. This requires, even in the case of the public schools, supported by the public and responsible to the public, the use of the advisory committee made up of employers and employees, through which the school in each of its vocational courses gets contact with the vocation. This reason for an advisory committee is self-evident. Your committee believes, however, that when a great fund like that of the Dunwoody Institute, managed by a private and self-perpetuating board, however able and well-meaning, divides with the public schools the task of giving specific trade education, there is another and added reason why an advisory committee should be obtained for each trade by the board of control. This reason is that the citizens of Minneapolis, through this advisory committee, may have a means of knowing how far the schools, both the regular public schools and the one providing the special fund, are meeting the interests of the vocations and the pupils; and, further, that the most efficient relationship between these two types of schools may be established to serve all interests concerned.

AN ESTIMATE OF THE MINNEAPOLIS SURVEY.

Concerning the Minneapolis Survey as a whole, Dr. Leonard P. Ayres, of the Russell Sage Foundation, said that the results go far beyond anything done before in this field. He especially commended Dr. Prosser and his co-workers. He pointed out that one difference between the Minneapolis Survey and previous ones was in the fact that it was an effort to present not only a "picture" of conditions, but also a "program" to be followed in bettering these conditions. Comparing the Minneapolis and the Cleveland Surveys he said, "In Minneapolis a survey is a conference; in Cleveland it is a tabulating sheet and computing machine.

In Cleveland the experts were experts in getting facts; in Minneapolis the surveyors utilized men who were experts in the trades. The Minneapolis method was best for Minneapolis; the Cleveland method best for Cleveland. Conditions were made especially favorable in Minneapolis for a "program" survey owing to the recent establishment of the Dunwoody Institute, with its large endowment just ready to provide any needed facilities for industrial education. Conditions were favorable also because of the general public interest in providing better educational facilities, and because the city Board of Education was ready to cooperate heartily. It was especially gratifying to the National Society to learn during the convention that the members of the School Board now stand ready to accept the Survey plan as outlined, and that it will proceed to carry out the Survey recommendations.

WE MUST FEED OURSELVES.

The International Harvester Company is doing a most commendable public service thru Prof. P. G. Holden and his assistants in its Agricultural Extension Departments. During the past year a special effort has been made to assist the farmers of the South who found themselves in a very bad financial condition when the war in Europe disturbed the cotton market. Professor Holden has been making an effort on a very large scale to prove to the southern farmers that a diversified crop system is safer and more profitable than the one-crop system that has been in vogue for the last forty years. He has conducted educational campaigns in several states with marked success. The burden of his talks is expressed in the sentence "We must feed ourselves." By means of charts and lantern slides he is effectively showing that an enormous amount of money is spent each year in the North by the Southern States for foodstuffs which might better be raised at home. Moreover, by reducing the volume of the cotton crop the price of it would be raised.

The following excepts from an account of the campaign which had its center in Memphis indicates the spirit and magnitude of this educational work:

> In August of 1915, the Memphis Business Men's Club organized a Farm Development Bureau. Then 150 of the leading business men and bankers visited their neighbors in eighty counties east, west, and south of Memphis. They said to the business men in these smaller cities and towns:
>
> "We are not here to sell you merchandise but to get you to join us in making an analysis of the real business problems in your county and to find out what becomes of the money made by growing cotton."

The Bureau soon found in the survey of their agricultural territory that all the cotton money was being sent away for food and feed which could be grown at home; that a one-crop system was making the soil poor and the crops short, and that injurious insects and plant diseases were doing great damage; that money was scarce and interest rates high; that a credit system of farming was practiced; that tenantry was on the increase; that there were poor schools, poorly equipped farms, bad roads, poorly paid teachers and preachers, and finally that the people were becoming poor.

The business men and farmers had heard of the campaigns of education put on in Arkansas and Alabama under the diretcion of Prof. P. G. Holden of the Agricultural Extension Department of the International Harvester Company. A committee called on Professor Holden in Chicago and convinced him that they meant real business and at his suggestion invited all others interested in the agricultural development of Memphis territory to assist. The Harvester Company agreed to furnish experienced advance men to assist in the organization work; to provide 30 trained agricultural lecturers, lecture charts and demonstration material for their use; and to print 1,000,000 pieces of literature for free distribution in the form of booklets on diversified farming, cattle tick, hog cholera, live stock, poultry, gardens, canning, home economics, sanitation, and other subjects dealing with the problems of the cotton belt states.

The Bureau asked the railroads to join. J. C. Clair, Agricultural Commissioner of the Illinois Central Railway, turned over to the campaign committee the services of the field men in his department. The Rock Island, Louisville & Nashville, Southern, Iron Mountain, and N. O. M. & C. railroads all responded to the call. The agricultural and mechanical colleges and agricultural high schools of Arkansas and Mississippi, the Little Rock Chamber of Commerce, Memphis Rotary Club, Farmer's Union, Women's Nineteenth Century Club, West Tennessee Normal School, Cumberland Telephone Company, Western Newspaper Union, Progressive Farmer, Memphis Commercial Appeal, News-Scimitar, and many other influential interests in the South cooperated.

After three weeks of preparation with an office force of ten people, nine advance men, the Profitable Farming Campaign was launched on November 9th, in Shelby County, Tennessee. There were sixty speakers engaged in the work, most of them being practical farmers from all sections of the United States. These speakers were divided into three crews, twenty in a crew. Three counties per day were covered, each crew holding from thirty to fifty meetings a day.

The campaign was carried on for twenty-eight days ending in Mississippi on December 11th. More than 2,100 meetings were held out on the farms, in country schools and churches and in the towns and more than 220,000 people heard the lectures. A million and a quarter agricultural bulletins, weighing over 40 tons, were distributed free to the people.

Each of the 70 counties covered in Arkansas, Missouri, Tennessee, and Mississippi had its own organization. In over 2,000 communities visited local campaign committee were on the job and assisting in the work. Farmers were not asked to come to town. The local business men in each county provided conveyances to carry the speakers to the country meeting places. And generally one or two of the town's business men accompanied each team of speakers to the country.

In this campaign the speakers and advance men traveled 80,271 miles over railroads and nearly 28,642 miles in automobiles, buggies, and wagons. Sometimes they started out on the day's work before daybreak and not infrequently they got back to the towns late at night, only to catch an early morning train out for engagements in the next county.

Interest in this big agricultural revival in the Memphis Trade Territory was far-reaching in effect. It was efficient in citizenship-making and character building. It was a work that will stand the test of time and rank high as an example of service well performed in behalf of community building.

THE COLLEGE AND VOCATIONAL GUIDANCE.

In an address delivered recently before the Iowa Teachers' Association, Kenneth G. Smith, director of the Department of Engineering Extension of Iowa State College, spoke of the college as the interpreter of the results of research for the benefit of the average man. He pointed out that experience has shown that the interpreting must be done by technically trained men. "Only a man who is master of his subject is competent to talk of it in non-technical and simple terms. A man must show that he not only knows his subject, but knows life and the bearing of his subject upon life. College men and women, as a whole, need to know more about living in order to take part in vocational work, for vocational education, after all, is education applied directly to the problems of life."

Following these statements Mr. Smith discussed vocational guidance:

In the recently developed work of vocational guidance a college of science and arts has a great opportunity. Dr. Frederic Keppel of Columbia University in a study made of occupations of college graduates gives some interesting information. He sent a question blank to eight hundred young college men at Dartmouth and Columbia for the purpose of finding out when they had decided on their life work, what their life work was to be, and whether the college was a factor influencing their decision. 519 out of 800 replied. 493 had made up their minds what they were going to do. 216 of these had done so before coming to college. The rest made up their minds during their college course or shortly after graduation. "In the great majority of cases," says Dr. Keppel, "the college was not mentioned at all as a factor in the student's choice." 29 referred to the college courses as influencing their decision. One man confessed that he had asked and taken the advice of his professors. It would certainly seem that a college ought to have more to do with a man's choice of life work than would appear from this investigation.

Dr. Keppel says further: "It is startling to read between the lines that the student has no expectation whatever that the faculty could or would be of any help whatsoever to him." How much the independent colleges help their students in choosing a life work, I do not know. I believe, however, that there

is opportunity for more definite work than has been done. A college could offer as one of its courses an "occupational seminar" open chiefly to students who had not definitely decided on a life work and in special cases to others. In this seminar different occupations could be studied in detail. Students who had decided on their life work would be asked to state the considerations leading them to a decision. Men of prominence in business, professional, and technical circles would be asked to address the seminar and to answer questions. At the end of such a course, the student ought to have some very definite ideas as to the opportunities and requirements in certain callings. This work could well be coordinated with the work in English as has been done in public schools and high schools, notably in Grand Rapids, Mich. Students who have chosen their life work before entrance, or who choose during the college course, should be urged to focus their studies to this end.

With such a course back of them, I believe many boys would enter a professional school with a more serious purpose. They would at least be able to give a reason for desiring to take certain courses, which is more than the majority can do now. I believe the general scientific or liberal arts course should not only lay the foundation for the future career, but also aid the student in making an intelligent choice of a career.

DESIGNERS: THEIR NEED AND TRAINING.

Dr. James P. Haney, director of art in the high schools of New York City, was recently asked to state what the schools are doing to meet the needs of the art trades in furnishing skilled workers in drawing and design. Dr. Haney said:

> New York City needs industrial designers. We have schools and to spare producing easel pictures, but our necessity is for a school which shall offer opportunity to the skilled artisan of any trade to learn the arts of design associated with that trade.

New York City, according to Dr. Haney, is just beginning to realize what continental cities learned many years before the war, namely, that for the successful winning of trade, it is necessary to have skilled designers in the industries. The right kind of industrial art training for boys is not yet well developed, but for girls it is in full operation, especially at the Washington Irving High School. A girl in this school after one year of high school training is encouraged to study industrial art if she shows any talent. The length of such an art course is two years. Two-thirds of the time is spent in drawing and design and one-third in English and related high school subjects. She is graduated not as a finished designer but as a student who has been taught to draw and design with great care and who knews the principles of color harmony.

After one year the student selects either commercial design and lettering or costume illustration. In either case she works from the original. There is no copying. If commercial design and lettering are selected the student works from motifs derived from nature. If costume illustration is selected she not only studies the technics employed by the best workers of the trade, but also designs and studies from living models. This lends a vigor to the sketches of the garments, not found in sketches made from conventional rules and proportions.

The teachers are continuous students of the needs and desires of the trade, and at the present time are making a survey of the opportunities open to women in the art trades. In concluding Dr. Haney said:

> Specialists the art teachers know they cannot turn out, nor would they wisely do so if they could. What would it profit a student to specialize as a silk or lace designer, if, when she left the school, she found that there was not an opening for her particular specialty in all the city. But if specialists cannot be made, all students may be trained by teachers who know trade conditions well, so that each may readily become a specialist in any commercial studio which has a director, anxious to forward his young artists along special lines.

THE RESULTS OF COOPERATION IN OREGON.

Frank H. Shepherd, assistant professor of industrial education in the Oregon Agricultural College, Corvallis, Ore., has inaugurated a plan for getting in touch with all the manual training vocational and industrial teachers on the Pacific Coast in a vitally helpful way. Professor Shepherd sent out a general letter to these special teachers, from which we quote one paragraph which will explain his plan and purpose:

> We want to gather together as many useful suggestions from all sources as we can, and pass them on to the teachers of manual training on our mailing list. Many ideas and devices in equipment, method, and practice have been tried out here and there that are known to but few but would be of value to others both from their positive and negative results. We plan to act as a bureau to collect and organize this material and through a series of circular letters to publish it for the benefit of all. The success of the plan depends upon the interest and cooperation of the teachers concerned, and our ability to evaluate and systematize the material furnished. We are willing to take a chance if you are. May we not hear from you?

The letter also invited requests for assistance in working out local problems, as well as constructive criticisms of any suggestions made in a bulletin entitled "A Course of Study in Manual Training," which had been mailed to the teachers a short time before. Accompanying the

letter was a list of "things for an eighth grade boy in manual training to know," with the suggestion that each teacher try them on classes and report results.

The response to this plan was surprising. Professor Shepherd's department immediately became a clearing house for questions and suggestions on all phases of industrial work. A great many persons asked questions and a goodly number made suggestions by telling what they are doing in their schools. This material was organized and the gist of the most significant replies was made the basis of the second cooperative letter sent out one month following the first letter. As indicating the character of the responses we mention the following:

In a small Minnesota town the manual training teacher and the county superintendent of schools are cooperating to extend the advantage of manual training to the rural schools. The teacher offered to conduct a Saturday class for rural teachers and sixteen took advantage of the opportunity. The class period is from 1:30 to 5:00 p. m. each Saturday. In addition to getting some technical knowledge, they are following out a plan of reading. As a result four rural schools have installed benches and purchased tools, and the boys are working on such projects as hog houses, chicken houses, farm gates, etc. As the teacher receives no additional salary for this Saturday work, it shows a fine spirit of helpfulness that is noteworthy.

A California teacher sent the following account of how he is working out the problem of manual training in its relation to vocational education:

Having charge of the industrial work in both high and grammar schools in the community, which, by the way, is principally agricultural, I have endeavored to make the course at the school fit the needs of the community; for instance, in the metal department, having no metal industry in this locality to make a basis for instruction, I took the farm as a base. A large percentage of the farms rely upon the gasoline engine for power in all their labor-saving operations; a knowledge of the gasoline engine is essential to the development of the boy. I have two different types of engines in the metal department, and expect to have more. These engines are taken down and reassembled by the pupils until they are as familiar with the internal working parts as they are with the external. To supplement this instruction small steam engines and water motors are constructed capable of producing from half to one horse power under certain steam and water conditions. Credits are not given except the finished product accomplishes its purpose, that is, it must run and produce the estimated power.

My next step is to purchase an old, but good, type of automobile engine which the pupils can take down, reassemble and study.

In the high school department each boy before engaging on a project is given a prepared time slip. He signs his name, grade, project, and cost of

materials. This slip is filed by the teacher. Every week the pupil enters on this slip the number of hours worked per week. At the conclusion of the operation estimate is taken as to the value of the work accomplished. Deduct outlay for materials, divide by number of hours; result, value per hour of student's work. This method has an extraordinary effect upon the quantity and quality of work accomplished by the students.

The success of this department is noted when the statement is made that this study is optional in the high school, and that 60 per cent of the total male enrollment are now entered, and probably 15 per cent could be added if additional accommodation could be provided.

The foregoing will suggest how far-reaching such a cooperative effort as Professor Shepherd has planned may become. Although launched only four months ago, the work involved in the project has far outgrown the original provisions for it. Next year Professor Shepherd plans to reach also the rural and village school teachers on the Pacific Coast.

WHERE FINE FURNITURE IS MADE.

On Saturday, January 29th, twenty-four members of the Boston Manual Training Club paid a visit to the furniture factories of A. H. Davenport, and Irving and Casson, in Cambridge, Mass. Here were seen the very finest examples of workmanship and construction, many of them being handwork supplemented by modern machinery. Most of the pieces made in these factories are made to order, few duplicates being seen, and, as many of the designs are quite elaborate, with graceful lines, only expert workmen are employed who almost amaze us by the wonderful results produced. Everything in the line of furniture is found here, from simple chairs and tables to carved and inlaid cabinets, clocks, and chamber furnishings. One chamber set is now being made costing over $3,000. There are twin beds in walnut, each post costing $32 to carve. The design is simple in lines, but elaborately ornamented. A clock case in walnut excited our admiration. It was a beautiful design, quite elaborate and splendidly made. The cabinetmaker being a Swede would give assurance of good workmanship.

Men work eight hours and forty minutes each day, closing Saturday at noon. They are paid 45 cents and upward an hour, their weekly pay being $21.60 to $25.00. The length of the week approximates forty-eight hours. Expert carvers are paid as high as $1.00 an hour, the best men being artists with pencil and modeling tools as well. One of these young men was modeling in "plasticene" a figure of an angel as a preliminary to carving the same in wood for a church altar.

Carving machines—six of them—are employed for rougher work, most of which is afterward finished by hand. The finishing rooms where staining, painting, coloring, gilding, shellacking, and French polishing are done, are attractive, as is also the upholstery room.

In construction the dowel is much used. Drawers are all dovetailed by machines. No long joints, as of table tops, etc., are done by hand, as a great and intricate machine not only planes the edges, but cuts a dovetail tongue, glues edges, and slides the boards one into the other, making a speedy and perfect joint.

Visits of this nature are a jolly feast to one interested in wood and its uses in furniture making. —Alexander Miller.



A JUNIOR SCHOOL IN TRENTON.

The city of Trenton, N. J., adopted the "six-three-three" plan of organizing its public schools in May, 1914. The resulting changes involve the erection of four junior school buildings in as many different sections of the city. The first of these, shown in the accompanying illustration, is now being erected on a four-acre site, and is expected to be ready for use next September. The land for the second one has been purchased. This will consist of seven acres. It should be noticed that the school is not called a junior high school, but merely a junior school, thus avoiding any intereference with the established term, high school.

Junior School No. 1 will be the largest public school structure in the city. Its capacity will be from 1,000 to 1,200 pupils. It will at the same time be one of the finest, if not the very finest, structure for its purpose in the country. An appropriation of $260,000 has been made for the building and its equipment.

From William R. Ward, supervisor of manual training, it is learned that the building will have a shop section, only a corner of which is shown

in the illustration, that will be devoted entirely to manual training and domestic science. This will contain ten units, or shops, each 45 by 60 feet. In the girls' half of the building there are two sewing rooms, fitting room, dyeing and pressing room, store room, and two kitchens, both subdivided into six individual kitchens, each equipped with gas range, sink, and dresser. There are two drawing rooms with stock rooms located over the kitchens.

In the boys' department there are metalworking, woodworking and printing shops, stock and tool rooms, drafting rooms and administration offices.

The shop building is directly connected on the sub-basement level with the stairway towers which run from the sub-basement to the top floor of the main building.

In every respect the building will be first class, and will doubtless be studied as a model in the near future by delegations of educators.

FOUR-YEAR GARDEN COURSE FOR GIRLS.

The U. S. Department of Agriculture working with the state colleges in charge of canning clubs of fifteen southern states have worked out a practical four-year garden and canning course for girls. They have been led to organize this course by the demands of thousands of southern girls who have been successful in raising tomatoes on tenth-acre plots. A report issued by the Department made the following statement concerning the purpose of the course.

> The purpose of this course is to start the girls with one crop, and from year to year add new annual crops, to encourage them to run winter and glass-frame gardens, and finally in the course of their work, to lead them to plant perennial, small, and orchard fruits. It is hoped that under this system the girls will gain knowledge of how to handle a wide variety of garden vegetables and trees and that the member by the time she gets ready to go to high school or college will have a garden of perennial fruits that readily can be cared for by other members of her family.

As a result of the planting of perennial fruits and vegetables, many thousands of girls will, in a few years, have permanent gardens containing not only annual vegetables but also a good variety of permanent fruits and vegetables.

To enable the girls to utilize the products of their permanent gardens, the agents give special instruction in making preserves, jelly, marmalades, pickles, etc. In some instances they have also demonstrated how the produce can be successfully marketed and sold.

SHOP NOTES AND PROBLEMS[1]

ALBERT F. SIEPERT, Editor.

ANNOUNCEMENT.

The competition for projects suitable for use in agricultural and rural high schools will close March 30th.

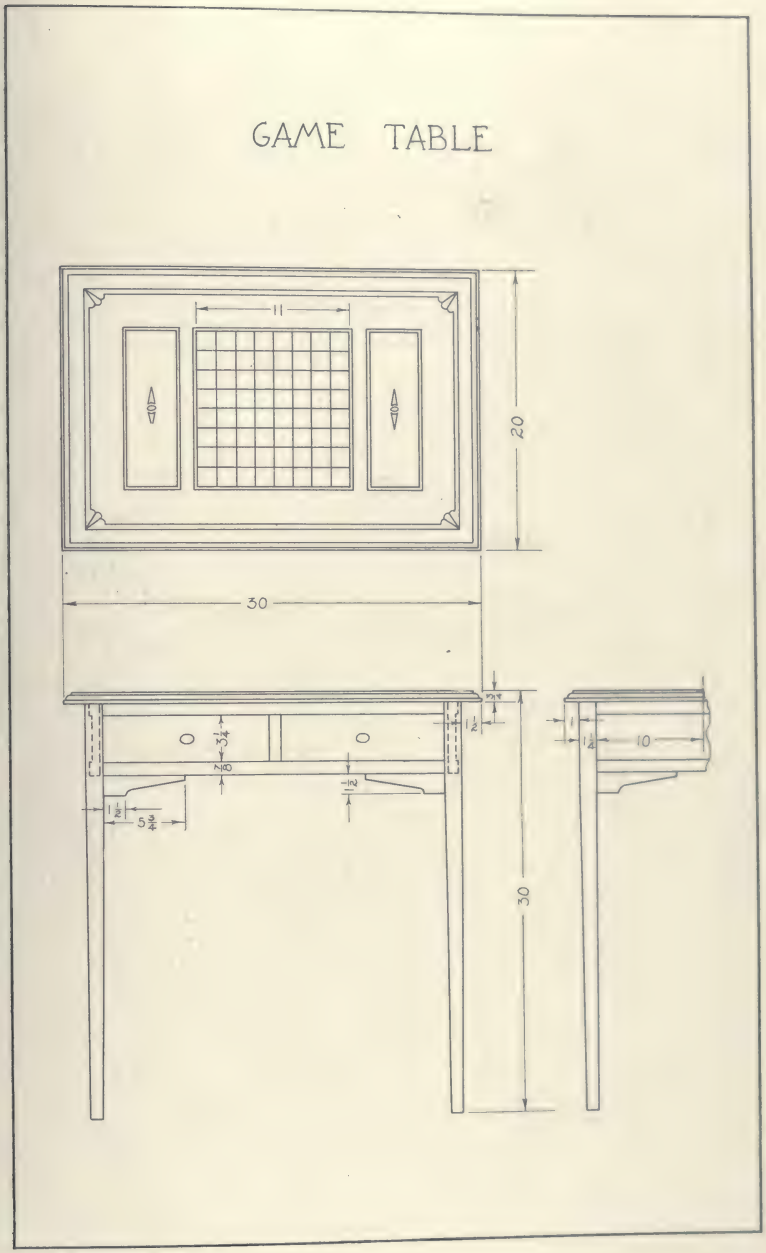
Good photographs, blueprints, or working drawings, together with brief descriptions, are desired. Suitable prizes will be awarded and the best material will appear in future numbers of this Magazine.

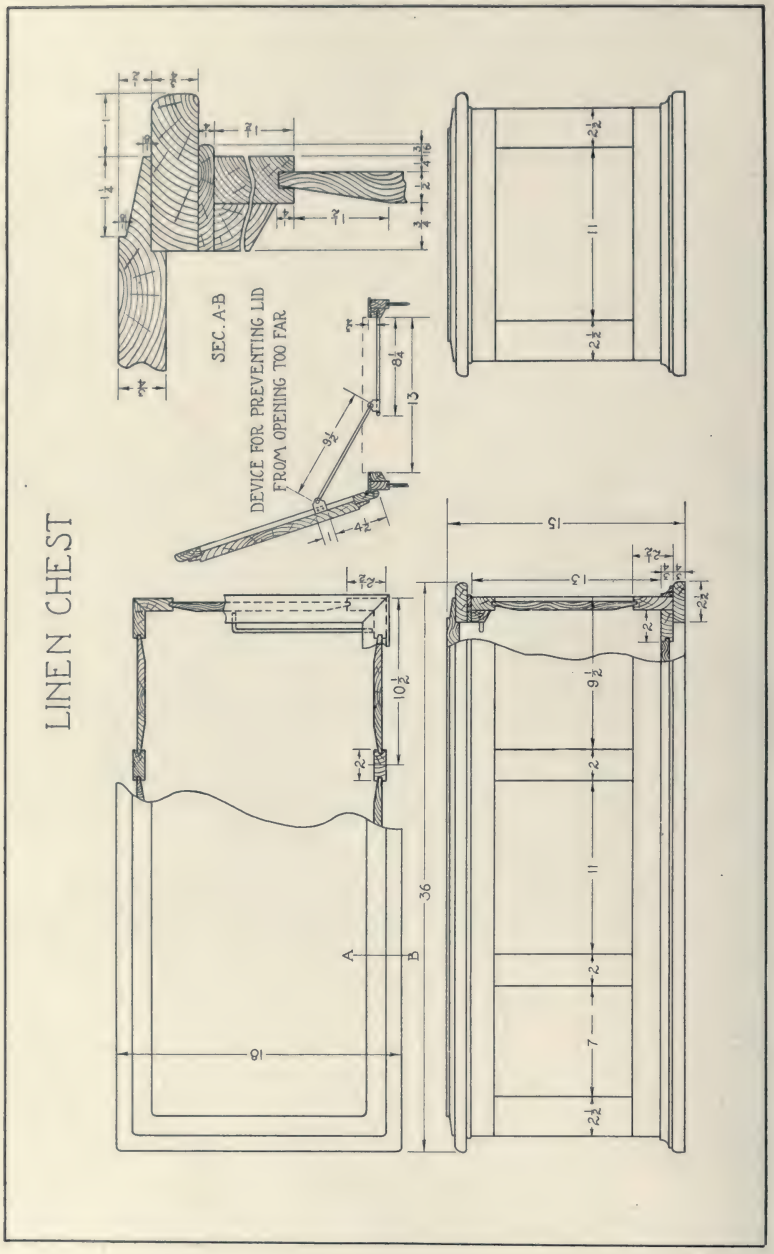


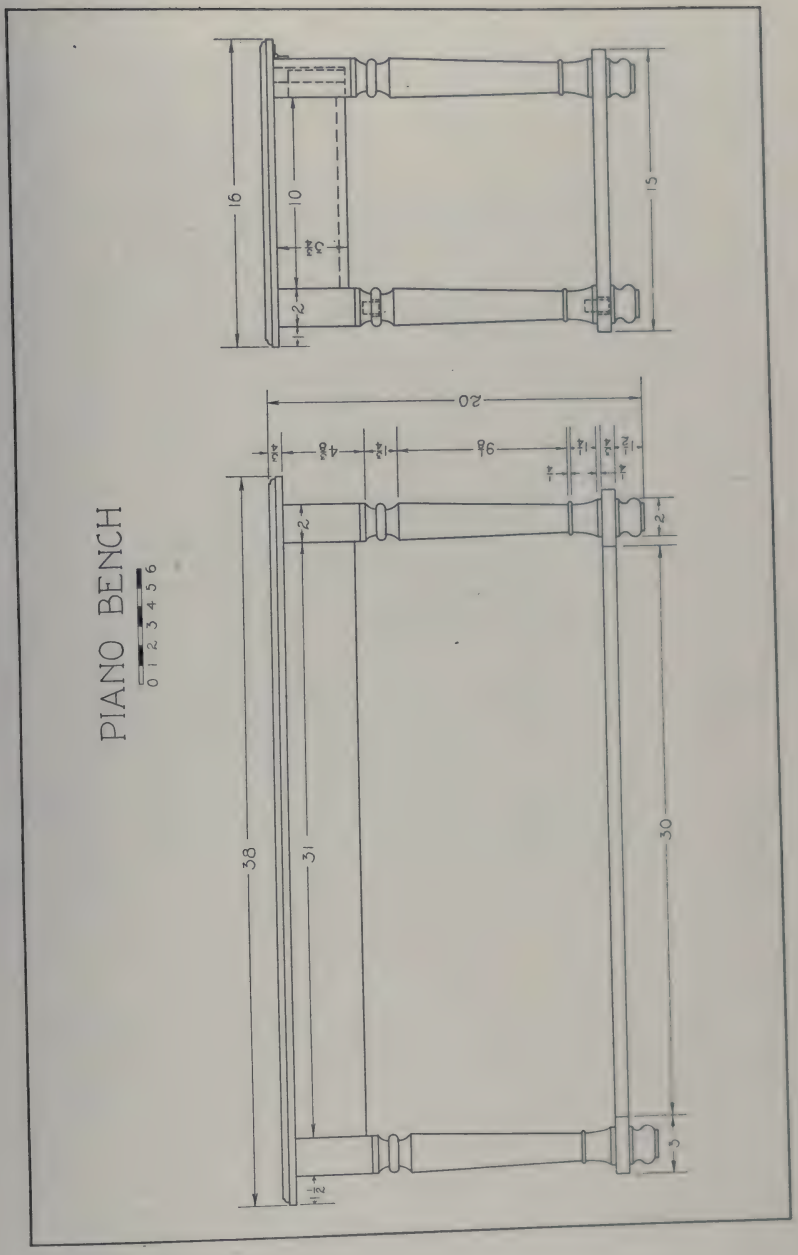
GAME TABLE.

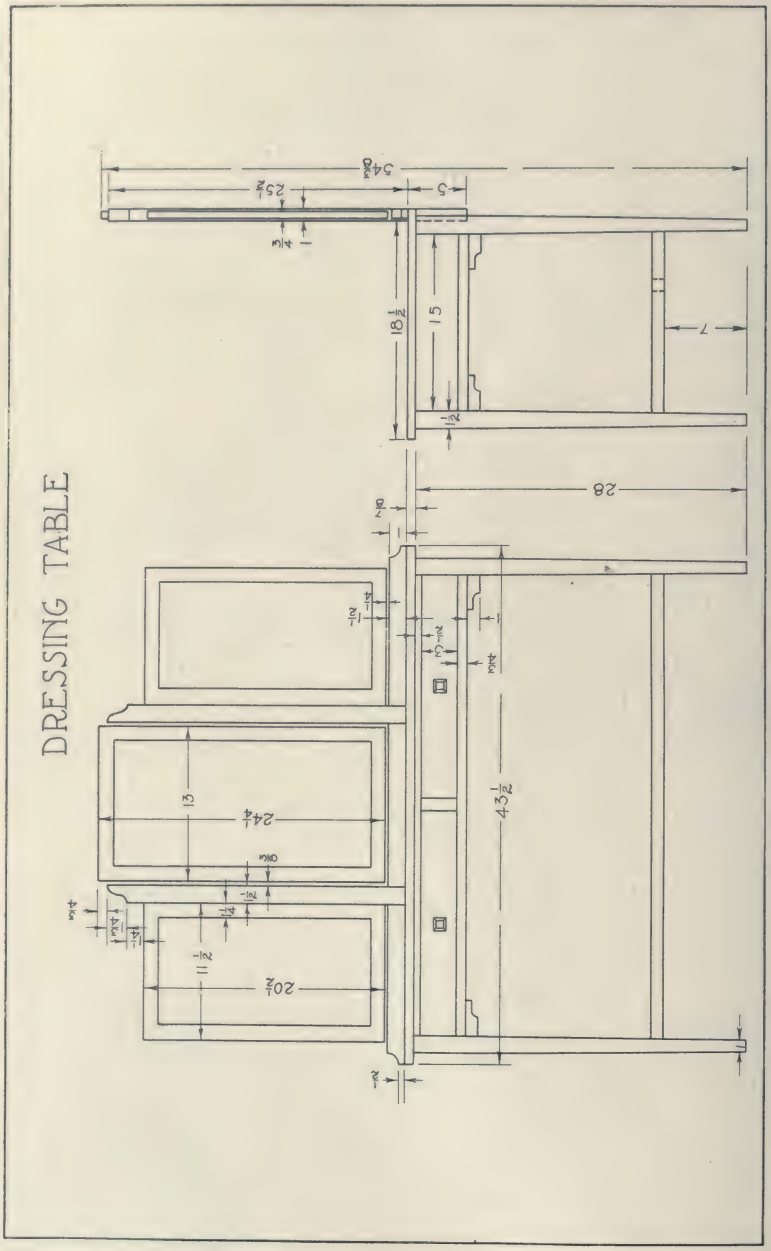
The question of a table for games is met by the project shown in the accompanying illustration. Cherry was used for the table proper while the inlay borders were made of osage orange, holly, and sandal wood. The photograph is distorted because of an effort to show the inlay.—H. C. Goodrich, Detroit, Michigan.

[1] The problems presented in this issue were designed and constructed by students in the Manual Arts Course for Teachers, at Bradley Institute, in the classes in constructive design and furniture making.


GAME TABLE
11
20
30
10
30


LINEN CHEST
SEC. A-B
DEVICE FOR PREVENTING LID FROM OPENING TOO FAR
36
A
B
18
15
13
11
10½
9½
8¼
7
2½
2


PIANO BENCH
0 1 2 3 4 5 6
16
10
3¾
2
15
20
2¾
4⅜
1¾
9⅜
1¼
⅞
⅞
1¼
2
2
38
31
30
3
½


DRESSING TABLE
54
25½
5
18½
15
7
28
43½
24¼
20½
13
11

LINEN CHEST.

This project involves panelling to such an extent that a universal plane is necessary for its completion. While the construction is evident, the cedar bottom and copper device for holding the lid open may be mentioned. This piece was made of quartered white oak, by J. A. Smith, Swayzee, Ind.



OAK DRESSING TABLE WITH INLAY BORDERS.

DRESSING TABLE.

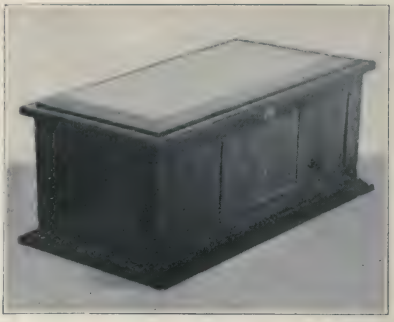
This project made of quartered oak was constructed by H. L. House, Kankakee, Ill. Inlay borders made of walnut and two strips of holly were used on the legs, drawer fronts, and support of the mirror frame. Dull brass drawer pulls are used. The piece was fumed and finished with shellac and wax.

PIANO BENCH.

A satisfactory piano bench, by A. G. Hansen, of St. Louis, Mo., is shown on pages 575 and 578. The legs are made of four pieces joined as indicated. The lid is hinged to provide a place for sheet music.



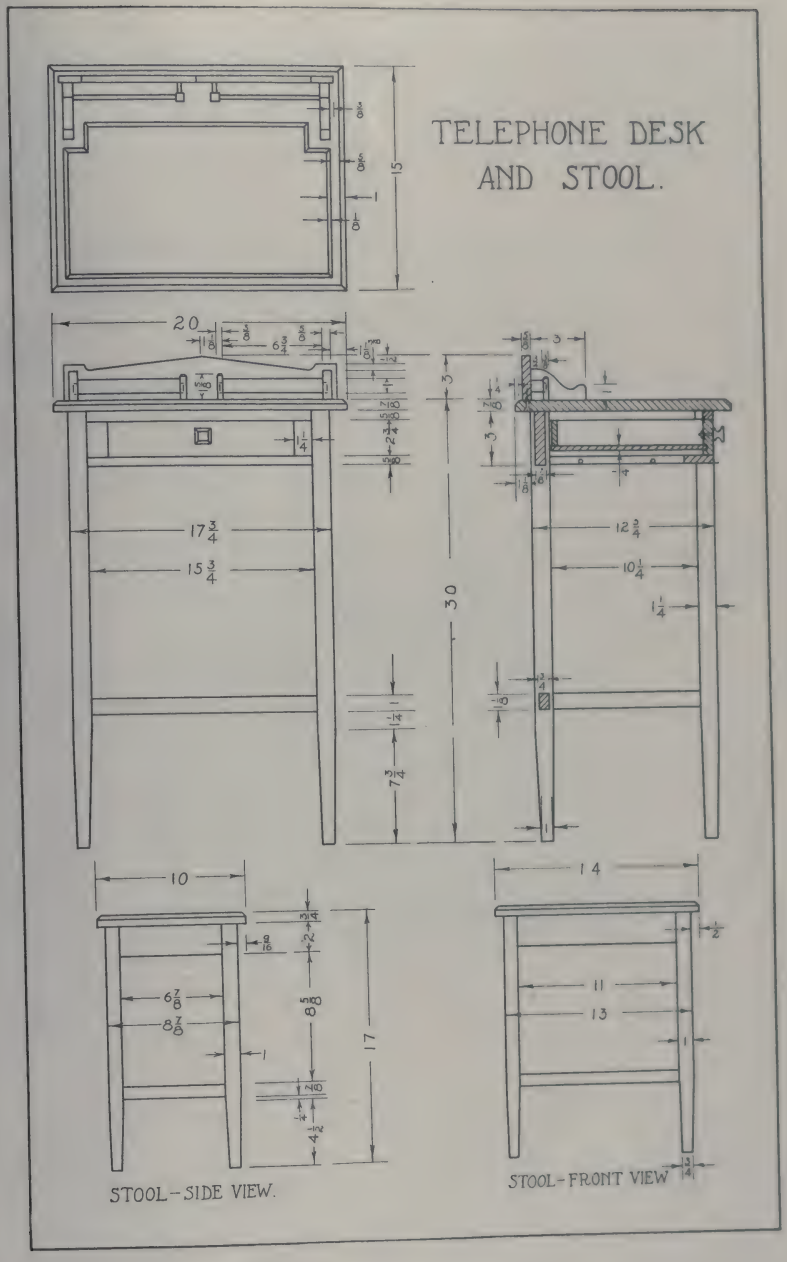
TELEPHONE DESK AND STOOL.



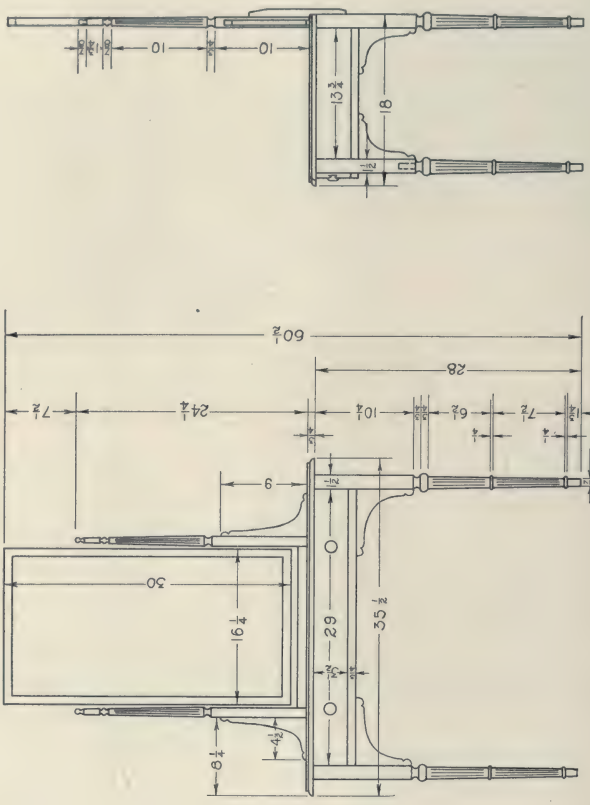
LINEN CHEST.



PIANO BENCH.


TELEPHONE DESK
AND STOOL.
20
15
17 3/4
15 3/4
30
12 3/4
10 1/4
1 1/4
7 3/4
10
6 7/8
8 7/8
8.8
17
14
11
13
STOOL - SIDE VIEW.
STOOL - FRONT VIEW

DRESSING TABLE



DRESSING TABLE.

This problem in furniture-making involves the application of turning and carving to the usual bench work. The legs are made of two pieces and joined as shown on the drawing, p. 580. Dovetail joints are used in the construction of the drawer, the curved front of which is not clearly shown. The project was made by W. B. Miller of Richmond, Ind. It is of black walnut finished with white shellac and wax.



DRESSING TABLE OF DIGNIFIED DESIGN.

TELEPHONE DESK AND STOOL.

The construction of this set presents no unusual difficulties, and should be possible from the illustrations, pages 578 and 579. The border lines on the table top in the drawing indicate inlay made of a strip of walnut between two very thin pieces of holly. These projects were made of black walnut and finished with white shellac and wax, by D. O. Weese, Lafayette, Ind.

REVIEWS

Learning to Earn, by John A. Lapp and Carl H. Mote, with introduction by William E. Redfield. The Bobbs-Merrill Company, Indianapolis. 5 x 7 inches; 421 pages; price, $1.25.

A prominent school man at a recent superintendents' meeting made the statement: "I give five years more of life to this stuff about vocational education." Perhaps he, in common with others, needs to read a book which has recently come from the Bobbs-Merrill press, written by John A. Lapp and Carl H. Mote, on "Learning to Earn," and even teachers of vocational instruction might profit by joining in and studying this plea and plan for vocational education. Both types—the man on the outside and the one on the inside—will appreciate better the importance of the subject and the field it covers, the methods adopted and results already attained.

The book touches the economic, industrial, social, and educational needs of our schools, our children, and our industries. It describes types of schools—household, industrial, and agricultural. It goes into various phases of expression of such schools—part-time, evening, continuation, all-day, and seasonal. It quotes freely from men and women in the field of education and pleads for vocational activities on the basis of educational thought ranging from a John Dewey to a Doctor Snedden. Possibly it is more of an encyclopedia of pleas than of plans. If so—and there is room for such a book on vocational education for reading circles—it may be due to the fact that one of the authors, Mr. Lapp, is the director of the Bureau of Legislative Reference in the State of Indiana, and is naturally an expert in the gathering of data of all sorts dealing with any industrial, social, and economic question. Furthermore, he was a member of the National Commission on Vocational Education and was largely responsible for the Indiana law of state-aided vocational instruction. He is a man whose work naturally has touched the important field of getting ideas across to the public. This book will do much to "put across" in the minds of the general reading public, the idea of the need for and the value of a learning-to-earn education.—A. D. Dean.

Forging of Iron and Steel, by William Allyn Richards. D. Van Nostrand Company, New York, 1915. 5 x 8 inches; 219 pages; 337 illustrations; price, $1.50 net.

This is a comprehensive textbook treating of subjects of iron and steel forging, and the tempering of tool steel. It is intended for the use of high school and college students.

All of the important processes necessary in practical forging, including the many new methods of welding, receive careful treatment. The general and individual equipment of the shop are also discussed. Tool steel and high speed tool steel receive special attention.

The chapters on the historic use of iron and steel, art ironwork and production of iron and steel should prove both of interest and value.

The many illustrations of materials, equipment, and methods of handling iron and steel add greatly to the value of the subject-matter. Added to the text is a course of study in outline which has been tested by the author. Altogether the book should prove of real value to teachers of forging.

House Painting, by Alva Horton Sabin. John Wiley and Sons, New York, 1909. 4¾ x 7⅜ inches; 121 pages; price, $1.00.

The primary purpose of this book is to place before the lay reader and amateur painter a small fund of very concrete information regarding outside paints, interior varnishes and stains, floor-finishes, and wall finishes, their composition and the best methods of application. The author also discusses briefly a few minor points such as glazing, care of brushes, and metallic paints.

The book will save many times its cost to the man who is building a new house or repainting and decorating an old one. It is especially desirable from the busy man's standpoint, because it can be read in one and one-half to two hours.

A Laboratory Guide and Note Book for Use in the Study of Food Preparation, by Beth Warner Mull Josserand (Mrs. Bruce Josserand). Domestic Science Publishing Company, Cimarron, Kan. 8¼ x 10½ inches; 283 pages; price, $1.25.

The purpose of this book is indicated by the title. It is a combination notebook intended for use in high school classes, and has been planned to meet the needs of teachers who desire to place in the hands of the pupils data which will enable them to proceed with the daily laboratory work without the necessity of dictation or blackboard preparation by the teacher. In this way much time of both teacher and pupils can be saved for other and more effective work. It thus provides for permanent and carefully arranged records of the laboratory work. This is in line with the methods used in teaching other sciences. The book also contains reference material covering books and equipment.

Descriptive Geometry. By H. W. Miller, John Wiley & Sons, New York. 5x7 in.; 149 pages; bound in black flexible leather; price $1.50.

This is a thoroly practical textbook on descriptive geometry. It gives a complete treatment of point, line, plane, intersections and developments, shades and shadows, and linear perspective. It also covers the principle of revolutions. A distinctive feature of the book which is appreciated by teachers is the section of the book devoted to "quiz sheets." The book is a revised edition of a book formerly published by the author.

The Writer's Desk Book. By William Dana Orcutt. Frederick A. Stokes Company, New York. 4½ x 6½ inches; 184 pages; price, 60 cents.

This book is a reference volume of technical information for the writer upon questions of punctuation, capitalization, spelling, syllabification, spacing, italics, abbreviations, proofreading, copyright, postal regulations, and related subjects.

The author was formerly head of The University Press, Cambridge.

Materials of Machines, by Albert W. Smith. John Wiley and Sons, New York. 5 x 7½ inches; 215 pages.

The book is divided into two parts. The first part deals with elementary metallurgy and with the manufacture of materials. The chemical properties of fuels, electric furnaces, refractory materials for fire brick, and the metallurgy of iron, steel, copper, and aluminum are some of the subjects treated.

The second part of the book deals with the properties of materials, explaining why certain kinds of metals fill specific needs better than others. The testing of

materials is thoroly discussed. The treatment of the different kinds of iron, steel, and non-ferrous alloys is valuable because not only are the peculiar characteristics of each fully described, but a practical concrete example of each is added to show the application.

The contents of this book should be of interest to one who designs or constructs machines; and to a metalworking teacher who desires to correlate some information of this type with the regular shop work.

RECEIVED

Report on the Work of the Bureau of Education for the Natives of Alaska, 1913-14. Bulletin No. 48, 1915, Bureau of Education, Department of the Interior.

Bulletin of The Metropolitan Museum of Art, New York City. Contains an illustrated article on the noted Clearwater collection of Colonial silver.

Industrial Education. A report of the Committee on Industrial Education at the Twentieth Annual Convention of the National Association of Manufacturers, New York City, May 25, 1915. The report contains reports of the new legislation in Pennsylvania and Wisconsin. Reprinted for distribution by the Bureau of Education, Washington, D. C.

The Danish People's High School, by Martin Highland. Included is a general account of the educational system of Denmark. Bulletin No. 45, 1915, Bureau of Education, Department of the Interior, Washington, D. C.

Report of a Survey of the Public Schools of Leavenworth, Kan. This Survey was conducted under the auspices of the Kansas State Normal School. The report on manual training by Ella V. Dobbs, of the University of Missouri, clearly defines the type of work in the manual arts as offered at Leavenworth. Bulletin No. 2, Vol. IV, Bureau of Educational Measurements and Standards, Topeka, Kan.

The Selection and Training of Teachers of the Household Arts, by C. A. Prosser. Reprint from the *Industrial Arts Magazine,* Milwaukee, Wis., July, 1915.

Annual Report of the Public Schools of Houston, Texas, 1914-15. Contains a statement of the development of the manual arts in Houston and outlines the work in the grammar grades and high schools. Issued by the Independent School District of Houston, Texas.

Annual Report of the Secretary of the Interior, for the year ending June 30, 1915. Issued by the Department of the Interior, Washington, D. C.

Spelling Efficiency in the Oakland Schools, by J. B. Spears. Publication No. 1, Bureau of Information, Statistics, and Educational Research, Wilford E. Talbert, Director, Oakland, Calif. A report of the Oakland spelling investigation of October, 1914.

Industrial Education Course at Oshkosh. Bulletin No. 43, 1915, of the Oshkosh State Normal School, Oshkosh, Wis.

A Dictionary of Simplified Spelling, compiled by Frank H. Vizetelli from the Funk and Wagnalls New Standard Dictionary and based on the publications of the United States Bureau of Education, the rules of the American Philological Association, and the Simplified Spelling Board. Funk and Wagnalls Co., New York.

MANUAL TRAINING AND VOCATIONAL EDUCATION

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FOREWORD

WE are glad to present as the initial article in this issue the interesting study of private trade schools in Chicago by *Miss Caroline Bengtson*, teacher of economic geography and industrial history at the Wendell Phillips High School, Chicago. The study was made while a graduate student in sociology and education at the University of Chicago. Miss Bengtson has had several years of experience in teaching in Nebraska and Colorado, has been a training teacher at the Southern Illinois State Normal School, and during the spring and summer of 1914 was an investigator for the food laboratory of the United States Department of Agriculture. We believe many of our readers will be surprised to learn the extent of the private trade school instruction in Chicago.

At the present stage of the development of vocational guidance, the facts concerning specific examples seem to be especially needed. One example is presented by *C. E. Westgate* in his article on "Vocational Guidance in the Stadium High School, Tacoma, Wash." The need of specific examples of successful methods of organizing vocational work is recognized, and the article on "The School Factory at Bradley Institute," by the Editor, should serve this purpose. It may be regarded as another article in the series dealing with the adaptation of the factory system to school conditions.

The old blue coverlid has received its fair share of attention by writers on the arts and crafts, and on colonial days, but so far as we know it has remained for *Miss Lurene Seymour* of the University of Illinois, to write of the process of making the coverlid from the technical standpoint. We present her description of the process in this issue.

Teachers of machine shop will be interested in the making of a leveling jack described by *Frederic H. M. Dunseith* of the Scranton, Pa., high school.

The article on the rural school problem, by *H. J. Whitacre*, treats of the adaptation of manual arts to rural schools.

The second article, by *William E. Roberts*, on the Cleveland Survey and the second article on caning, by *L. Day Perry*, complete our offering of articles in this issue.

The "Of Current Interest" department gives considerable space to the Minneapolis meeting of the National Society for the Promotion of Industrial Education.

This Magazine is kept for sale at McClurg's in Chicago, and Brentano's in New York.

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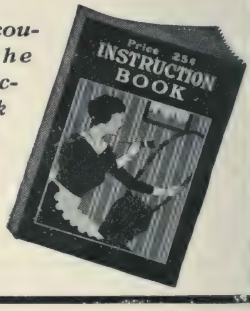
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FIELD NOTES

AT this season of the year the work in many manual training shops centers around the building of bird houses. In fact, this movement has attained such proportions in some places that each spring a bird house exhibition is held in which the whole community takes a lively interest. This year a bird house contest is on among the sixth grade boys in St. Paul in which the *St. Paul Daily News* has offered a prize of $25 in gold for the best bird house. Dozens of other prizes are given by public-spirited individuals and firms. Indeed, the enthusiasm is so great that all left-over work of last term has been completed in order to clear the way for the bird house work. The results will be eagerly awaited by the contestants.

The pupils in the sixth, seventh, and eighth grades of Bemidji, Minn., are also in the midst of a bird house contest. Prizes to the amount of $30 will be distributed among the contestants. The movement for the conservation of birds is finding a ready response in this activity that gives play to a boy's constructive tendencies rather than the reverse. In one of our large cities last year 2,400 bird houses were entered in a contest, and in another city 2,700 were entered. This will give one some idea of what a hold the movement has obtained among the boys whose energies have been directed into this channel.

COMMUNITY PROBLEMS.

In the Borough of New Providence, Jersey City, an excellent community problem recently worked out has revealed the possibilities of manual training in a very practical and conclusive way. Pending the erection of a much-needed addition to the present building the manual training teacher proposed the erection of a temporary one-room building in the rear to take care of the increased attendance. The suggestion was agreeable to the Board of Education, and with the assistance of 49 boys a building was erected in less than two weeks. It is 20 ft. 4 in. wide by 28 ft. long, has 2 by 12 in. floor beams, 2 by 4 in. studding, 2 by 6 in. rafters, and 2 by 4 in. ceiling beams.

When the building was begun it was impressed upon the boys that it would be a privilege to work on it, and that they could work only before school in the morning, at recess time, half the noon hour, during their regular manual training periods, and on Saturdays. No one was allowed to stay after school in the afternoon to work on it. From the time the building was started until it was finished there was no lack of help; in fact it was necessary to limit the boys to certain periods of time. The following is the total cost of the building exclusive of heating, which was done by running a steam pipe from the main building and putting in four radiators: Lumber (including wall board), $422.52; hardware, $9.93; paint, stain, and varnish, $14.36; unskilled labor, $56.50, making the total cost, $503.31.

Another community problem of a different character was recently worked out enthusiastically by the high school students in Kokomo, Ind. In producing the musical comedy "Windmills of Holland," several departments of the city schools were asked to cooperate. A large amount of massive scenery of a kind not to be found in small cities was required, and an appeal was made to the manual training department, with the result that two big Dutch mills were constructed, one 19 ft. high and the other 16 ft., with a large dike for the background. The canvas for this setting and several drop curtains were sewed by the girls in the domestic science department. The business management of the production was in the hands of the commercial department, boys and girls in that department taking charge of the sale of tickets, the general publicity, and the payment of all bills.

OHIO INDUSTRIAL ARTS ASSOCIATION MEETING.

The annual meeting of the Ohio Industrial Arts Association was held at Columbus on the 11th and 12th of February. Friday afternoon was spent in visiting schools, and in looking over the creditable and remarkably well displayed exhibit of the manual training work of the public schools of Columbus, shown at the Carnegie Library building. This exhibit showed work of each of the city schools and was prepared under the

(*Continued on p. VI.*)

direction of W. B. Dee, supervisor for the city of Columbus. The first session took the form of a banquet where eighty men sat down together. This was the largest attendance in the brief history of the Association. The speaker of the evening was Judge Baggatt of the Dayton Juvenile Court, who gave what was essentially an appeal for a sympathetic recognition of the real motive and character of the boy who plays hooky. He considers that the manual training teachers have greater opportunities than any other persons in many communities to lead such a boy aright.

The following morning there were two speakers; Superintendent Shawan of the Columbus public schools, who spoke on the subject: "Lead or Drive, Which?" and Charles A. Bennett of Bradley Institute, who spoke on "The Present Outlook in the Field of the Manual Arts." At the session held on Saturday afternoon, John H. Chambers spoke on Dayton's Cooperative Printing School. At the business meeting J. W. Moyer, of Sandusky was elected Secretary-Treasurer to take the place of Professor Clinton S. Van Deusen of Kent, who by the constitution becomes president of the society for the coming year.

This year's president, who was responsible for the program, and was chairman of all the sessions of the convention, was J. I. Lambert, supervisor of manual training in Dayton.

ANNUAL MEETING OF BOSTON MANUAL TRAINING CLUB.

The annual "get-together" dinner of the Boston Manual Training Club was held in the new dining room of the Boston City Club on Saturday evening, December 18th. There were 120 men present. This annual meeting proved of special value in stimulating fellowship, and the inspiration and enthusiasm engendered were distinctly uplifting. In the evening's program cultural as well as vocational preparation for one's life work, and the advantages of being well-trained in art, architecture, sculpture, painting and music, were fully set forth. Emphasis was also placed on the present-day need of normal training for all teachers, and the future possible refusal of Massachusetts to employ teachers without state certification. This is a point which is being deeply impressed upon the public by Dr. David Snedden, State Commissioner of Education. The guests and speakers of the evening were as follows: James P. Monroe, manufacturer and former member of the State Board of Education; R. Clipston Sturgis, one of Boston's best architects; Frank E. Thompson, assistant superintendent of schools, Boston, and supervisor of manual arts; and James Frederick Hopkins, state supervisor of art training.

MEETING EMPLOYMENT PROBLEMS

In anticipation of the problem of employment which was soon to confront 75 boys upon their leaving the grammar schools, Alfred P. Fletcher, assistant superintendent of schools, Rochester, N. Y., called these boys together a few weeks ago to talk over with them their future possibilities in the world of industry. In this conference also were Harry C. Taylor, superintendent of the State Employment Bureau and Raymond C. Keople of the State Department of Vocational Education.

Mr. Fletcher gave them detailed information about the courses offered in the Rochester Shop School, and also facts concerning the industries of that city and the securing of positions in them. The apprenticeship agreements between the Board of Education and the different trade unions, by which boys are placed in good positions at the completion of their technical courses, were fully explained. Every boy was urged to attend one of the school shops if possible. Mr. Taylor set forth the difficulties that a boy under sixteen encounters in securing employment, pointing out that public sentiment is arrayed on the side of the law against it. Mr. Keople recently made a survey of the leading industries in Rochester and was therefore able to give the boys helpful advice thru his first-hand knowledge. Booklets on the machine and woodworking industries were distributed at the close of the conference.

A similar meeting covering the same problems and their relation to girls' work was held later.

Charles H. Winslow has been employed by the Indiana State Department of Public Instruction to make a vocational survey of the state. It will be recalled that in Indiana vocational

(*Continued on p. VIII.*)

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work is compulsory, and for this reason it has been deemed quite necessary that a careful study should be made not only of the exact needs of vocational training in certain typical Indiana communities, but it should also be ascertained how far these needs for vocational training are met by the existing school work, and what additional plans should be made to give the people of these particular communities and the state as a whole, the help they need to train their people to be more productive and efficient workers. Mr. Winslow was a member of the committee that has just completed the survey in Minneapolis.

On January 28th, the Cleveland Manual Training Club held its second meeting at the Central Y. M. C. A. After a reception and dinner C. J. Thompson, of Elyria, delivered an address on "The Normal Distribution of Grades." The many points entering into scientific and efficient grading were carefully explained. After the discussion it was felt that this is a subject which deserves more attention and study than it has received hitherto. W. E. Roberts briefly reviewed some of the important events which transpired at Minneapolis during the recent meeting of the National Society for the Promotion of Industrial Education.

The officers of the Club are C. M. Williams, Elyria, president; O. C. Davidson, Elyria, secretary; and A. S. Gregg, Lorain, treasurer.

The local Association of College Alumnae in Omaha has recently made a survey of the number and variety of schools in that city which offer vocational courses, and it was found that there are 87 such schools. The list covers agriculture, architecture, painting and drawing, music, dramatics, dancing, industrial arts, household economics, commercial education, law, library training, medicine, normal training, nursing, physical training, religious training, and correspondence schools. Nursing leads in the number of different schools, there being twelve.

At Christmas time the fourth grade boys in the Middlesex County Training School, Lowell, Mass., completed a doll house. It was built from a plan, scale one inch to the foot, and was 32 by 30 inches. The building is two stories high, having a front and a back piazza, bay window, and staircase leading to the upper floor. The windows of the lower floor slide up and down like the windows of any ordinary house. The down stairs rooms are all papered, and the floors are covered with linoleum. The roof is fireproof, being covered with asbestos shingles. When completed, the Lowell Electric Light Company wired it for lighting, displaying it in their window for a few days, and the heart of a little girl was made glad by receiving it for a Christmas present.

On January 8th the Boston Manual Training Club held its regular monthly meeting with over 50 members present. The January is always a business meeting and considerable time was spent in the election of 17 new members who had been proposed and vouched for by other members. The membership of the Club, numbering 250, altho composed largely of Massachusetts men, also includes men from Maine, New Hampshire, Connecticut, Rhode Island, and Vermont, as well as some scattered throughout the West and South. The Club is a representative group of thoroly practical and successful teachers of the manual arts. At the completion of business a lecture with stereopticon views was given by Mr. Hathaway and Mr. Silsbee of the Carborundum Company, on the discovery and subsequent manufacture of carborundum as an abrasive in its many forms. A large block of this material as it comes from the furnace was presented to the Club.

Plans for a cooperative vocational bureau to aid Dartmouth College students in gaining business experience during the long summer vacations, was the subject of a recent conference between President Ernest F. Nichols of Dartmouth, representative Dartmouth professors and graduates, and influential business men of Boston. It is proposed to establish a summer employment bureau which will furnish work for Dartmouth boys for which each one is adapted or along lines which he proposes to follow eventually. It is thought that by the right use of three summer vacations a student will obtain sufficient practical experience to place him at least one year in advance of where he would be without this opportunity.

Those attending the conference were the week-

(*Continued on p. X.*)

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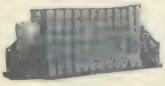
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FIELD NOTES.

(*Continued from p. VIII.*)

end guests of A. Lincoln Filene at his Weston home.

Plans for the foundation of a large industrial engineering research laboratory under the auspices of Columbia University are set forth in the annual report of the dean of the graduate school. The plan outlined calls for the immediate erection of a building easily accessible to the university with water and railroad facilities, which with the necessary equipment would cost $500,000. This would be but an initial step, however, as it is ultimately proposed that a research foundation of from $2,000,000 to $5,000,000 be secured, the income to be used exclusively for engineering research. Columbia's engineering school has been recently placed upon a graduate basis, opening the way for more intensive as well as extensive research work.

The second annual lecture course for housekeepers recently announced by the Extension Division of the University of Washington covered subjects quite beyond the usual lectures on scientific cooking, domestic art, and the different phases of domestic science. It included interesting and important fields hitherto untouched. The vice-president of a national bank in Seattle was announced to speak on the subject of investments, telling housewives how to invest small amounts of money in safe and serviceable ways. The state health commissioner spoke on cleanliness in the home in the prevention of disease. A lecture on the state laws which are of interest to women and a talk on textiles were also a part of the program.

On grounds covering 1,050 acres, upon which are 66 buildings, the Moose Order maintains the Mooseheart Training School for Children, located at Mooseheart, Ill. In this school for orphans and half orphans decided emphasis is placed upon vocational training. One-half of each day for twelve months of the year, excepting two weeks' vacation, is given to this phase of school work, the other half being given to the regular school studies. The grounds, buildings, and equipment represents a total investment of $1,500,000.

One of the grammar schools in Springfield,

(*Continued on p. XII.*)

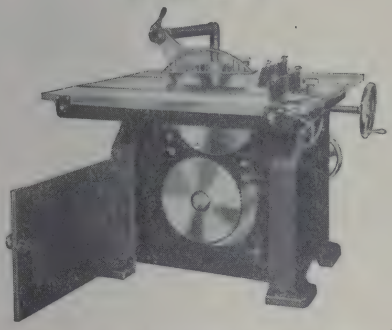
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OLIVER MACHINERY COMPANY
Grand Rapids, Mich.

FIELD NOTES.

(*Continued from p. X.*)

Mass., has been transformed into a junior high school, beginning with the present semester. The school will continue to take care of its grammar-school pupils, but the revised courses of study will allow the pupils to shorten their terms at the high school. The following courses will be offered in the new department: General, academic, commercial, high school preparatory and practical arts. In the high-school preparatory course the pupil will be able to elect courses in Latin, algebra, history, English, and civics, in addition to completing grammar school studies.

A movement to interest the manufacturers of Troy, N. Y., in the city's vocational schools, has been inaugurated. An advisory board has been formed which will visit the schools, and the various plants will be opened at intervals to the machinery classes. Representatives from the leading industrial plants have evinced considerable interest in this effort to bring the school and industry into closer relationship.

The Boston Clerical School, which was established in September, 1914, by authority of the School Committee, of Boston, recently had a demonstration session in order to better acquaint parents and friends of pupils, and all others interested, with the purpose and character of the school. It is an entirely new type of public school, offering a vocational training for girls by a method different from any that has been attempted before in a public school. Courses are offered which prepare for positions as secretaries, stenographers, bookkeepers, and general office assistants.

Progress is individual, depending upon one's own effort and ability, and pupils complete courses when they have met the required standards of accomplishment. New pupils are admitted at any time.

In order to add a machine tool grinder and a drill to their equipment, the eighth grade boys in the manual arts department of the public schools in Cando, N. Dak., took orders for picture frames. They made the moulding with a Stanley combination plane, glued the joints, and finished them up in various suitable finishes. The proceeds were sufficient to pay for the

(*Continued on p. XIV.*)

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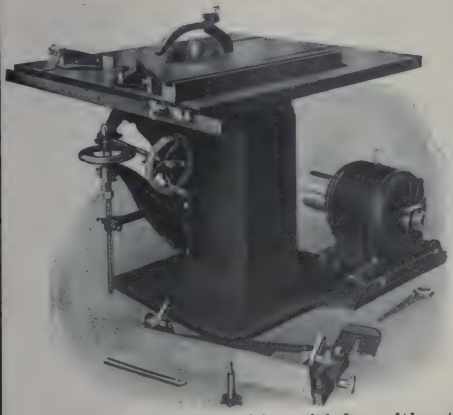
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FIELD NOTES.

(*Continued from p. XII.*)

desired additional equipment. Dale F. Griffin is supervisor of the work in the Cando schools.

In line with the present efforts of the United States Bureau of Education, the Central State Normal School, Edmond, Okla., in developing the work of the manual training department, is giving special thought to the needs of the rural communities. They also give one hour each day to the boys in the Edmond public schools. The work in this department covers all phases of woodwork, foundry work, elementary handwork, pottery, and printing. V. O. Wilson, who is a graduate of the University of Chicago, has had charge of the work for eight years.

Under the direction of Dr. James P. Haney, head of the art department of the New York City high schools, the second contest for the Municipal Art Society trophy for good draftsmanship was held recently. The pupils do not compete as individuals but as groups representing different high schools. On the same day, teams from nine high schools contested for a similar trophy offered to advanced pupils by the School Art League. In both contests the De Witt Clinton high school won first place and will hold the two trophies for six months, the next competition being scheduled for June, 1916. The trophies were specially designed medallions.

In compliance with petitions from the printers' and plasterers' unions in Springfield, Mass., the vocational school in that city has opened evening classes in these two trades. The course in printing has been requested for boys who are employed on the local newspapers and have no chance in their ordinary work to learn the fundamentals of job printing, setting type by hand, running a press, figuring stock, estimating jobs and other matters of that nature.

A course in practical paper-making taught on a large scale is under the consideration of the school board of Holyoke, Mass. It is planned to have the new course cover every department of a paper mill, from the rag room to the coloring laboratory. In addition to being of help to those desiring to enter the paper-making industry, it is hoped that those already in the trade will take advantage of this opportunity to increase their

(*Continued on p. XVIII.*)



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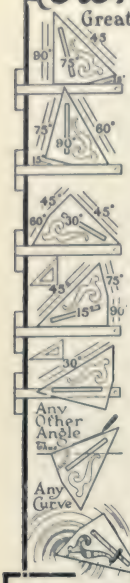
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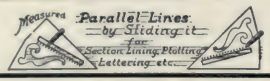
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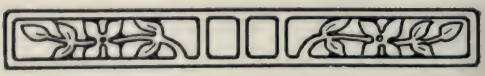
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FIELD NOTES.

(*Continued from p. XIV.*)

efficiency. The cooperation of manufacturers has been assured even to the extent of permitting students to enter the mills for practical teaching, and the papermakers' union have also agreed to support the movement.

Special courses in vocational education will be a feature at Teachers College during the second half-year. The course will be given by Arthur D. Dean, director of industrial education of the New York State Department of Education. One of the courses, "Problems in Vocational Education," which has been planned for those persons engaged in educational, industrial and vocational work, will be given on Friday evenings.

During the Minneapolis convention of the National Society for the Promotion of Industrial Education, the United States Bureau of Education held an informal dinner and conference on the "prevocational school" at the Hotel Dyckman. The attendance was large and the speakers entered into the spirit of informal discussion stimulated by the chairman, Dr. William T. Bawden. A summary of the discussion will be prepared by the Bureau.

The capacity of the prevocational school in Des Moines, Iowa, which is situated in the heart of the business district, has been so taxed that the Board of Education has decided to relieve the situation for the present by adding a one-story shop building to the Franklin School, at a cost of $20,000, with an appropriation of $10,000 additional for equipment. This will enable them to expand the prevocational work to quite an extent.

The recent survey in Minneapolis disclosed the need for a two-year commercial course in the high schools. Many students upon entering high school cannot look forward to four more years of schooling, and for such pupils a definite course covering two years is preferable to two years' work in the regular four-year course. In the Cass Technical High School, Detroit, Mich., a two-year commercial course has been in operation for the past six years for pupils who desire to become bookkeepers or stenographers. In the course for bookkeepers, the subjects taught are typewriting, bookkeeping, business English, and

(*Continued on p. XX.*)

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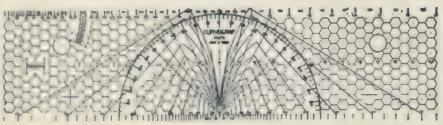
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FIELD NOTES.

(*Continued from p. XVIII.*)

legal forms. The course for stenographers is the same except that stenography is substituted for bookkeeping.

A bill to provide for the establishment of an independent industrial school in the city of Lynn, Mass., was recently given a hearing before the legislative committee on education. The purpose of the school is to train boys in the trade of shoemaking. It was urged that this trade should be as well taken care of as the textile industry, so far as schools are concerned. The city of Lynn is willing to bear the major part of the expenditures. It is proposed to rent floor space for a while during the experimental stages, and then later take steps to procure permanet quarters.

The Ohio State University is planning the details for a college of commerce and administration to be established next September. Courses will be given in banking and finance, insurance, foreign and domestic marketing, manufactures, transportation, accounting, charity organization, recreation and playground work, social and public service. The school of journalism, and the courses in economics and sociology, now under the collegs of arts, philosophy, and science, will be transferred to the college of commerce.

High school statistics for Illinois, recently published by the State Department of Public Instruction, give the following figures concerning the courses offered in the state: 595 schools offer academic courses, 192 commercial courses, 140 technical courses, 86 agricultural courses, and 150 domestic science courses.

To meet the needs of the blind who are unable to attend the state institution at Baton Rouge, La., a movement has been inaugurated in New Orleans to provide industrial courses in the public schools for these unfortunates.

The fullest utilization of all school shop equipment is being urged by school officials in Duluth, Minn. To this end short extension courses to be given in the spare hours of apprentices have been suggested. It has also been suggested that the schools should be opened at 8 a. m. and kept in operation until 5 or 5:30 p. m. and again from 7 to 10 p. m. for the benefit of those employed during the day.

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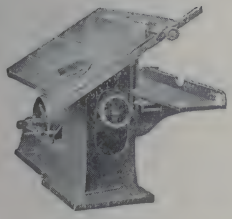
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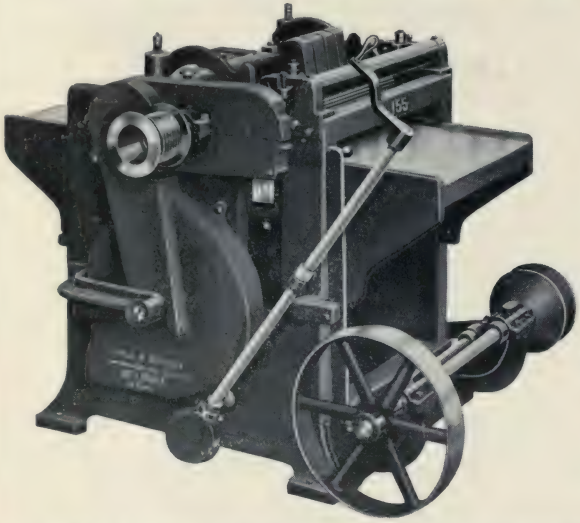
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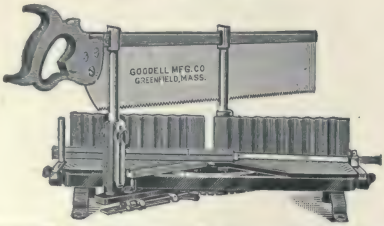
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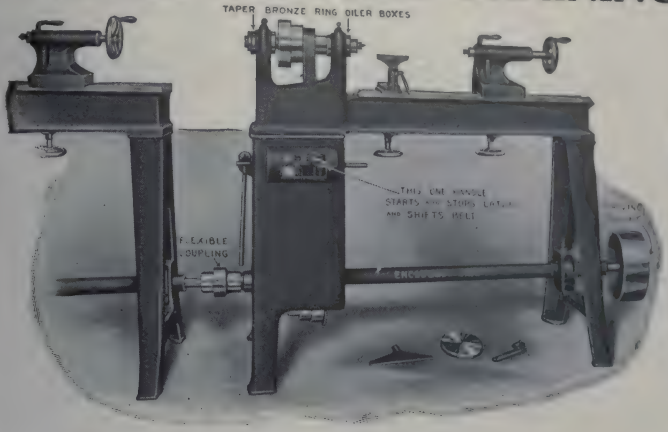


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BOOK NOTES

The February issue of *Book News* has just been distributed. A copy has been mailed to every reader of this Magazine. If your copy failed to reach you a postal card request will bring a copy to your desk. *Book News* will be mailed free of charge to any one interested in books on manual arts, vocational or industrial education. If you have an interested friend send us his name and address, and a copy of *Book News* will be mailed to him from time to time. No doubt he will appreciate your kindness.

Shop Problems Series No. 2 will be published about the time this Magazine is distributed. This is the second of a series of portfolios of tracings by Albert F. Siepert. The first portfolio met with approval from the readers of this Magazine and teachers of manual training everywhere, as shown by the fact that the first edition of Series No. 1 was exhausted within a few months after publication. This form for drawings is very convenient for teachers desiring new projects for student work as it gives a variety of projects at small cost, and from them blueprints can be made. The present series includes working drawings which have appeared in the "Shop Notes and Problems" department of this Magazine during the current volume. It will be published uniform with Series No. 1 in size and style, and the price is 25 cents.

The demand for information on bird houses, including working drawings and designs, has been so persistent that we have decided to publish a reprint of the matter which has appeared in this Magazine. This reprint by Albert F. Siepert, entitled *Bird Houses That Boys Can Build,* will be published soon as one of the manual training reprint series. It will show working drawings and photographs of a large number of bird houses, and will contain much information which will be of practical help to the student constructing bird houses, and to the teacher interested in developing this line of work among his students. The reprint will not only deal with bird houses but will also show bird baths, feeders, food shelters, sparrow traps, and other bird accessories. It will show illustrations of successful bird house exhibits which have been conducted in several cities.

Art in Dress is the title of a paper-bound text for the use of students in domestic art which is soon to be issued by the Manual Arts Press. This book has been written by Miss Lydia Bolmar and Miss Kathleen McNutt, of Topeka, Kan. It presents in a simple, direct manner, and with illustrations, the fundamental principles of art as applied to dress. Added to these are notes on home decoration. It is believed that there is great need for such a text, especially in high schools and normal schools, where an effort is being made to teach guiding principles in the matter of art in dress and millinery. The book will be practical, convenient, and inexpensive.

Complimentary statements concerning *Problems in Farm Woodwork* are coming in from many sources. From the professor of industrial education in a great university comes this one:

"We feel that it is the best thing of the kind which we have seen, or perhaps it would be nearer the truth to say that we have seen nothing like it.

"As a reference book it should be in every school shop except, perhaps, in the large cities. It will be especially useful in the country high schools where manual training is given."

From a state agricultural education expert comes the following:

"I consider this one of the best books on the correlation of manual arts and agriculture that I have ever seen. It has a large number of practical problems which should prove of unusual interest to the teacher of manual training in the small community, and to the teacher of mechanic arts in the agricultural high schools."



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First Prize—George Withrow, Grand Rapids, Minnesota.
Second Prizes—Norman R. Hall, Little Rock, Ark.; Alton Russell, Grand Rapids, Minn.; Harry McClain, Grand Rapids, Minn.
Third Prizes—John Oaks, Grand Rapids, Minn.; Benjamin Rickli, Dallas, Ore.; Mat Hefti, La Crosse, Wis.; Wendell D. Tompkins, Rochester, N. Y.; Edward Schweitzer, Jr., Wilmette, Ill.
Fourth Prizes—Francis Magnuson, Grand Rapids, Minn.; John Logan, Grand Rapids, Minn.; Robert E. Tompkins, Rochester, N. Y ; Earnest Hepfelt, Grand Rapids, Minn.; Randolph W. Chaffee, Somerville, Mass.; Ralph Zimmermann, Sutton, Neb.; Harry Clark, South Acton, Mass.; Joseph M. Cummings, Newport, R. I.; Donald Strudley, Stratford, Ont., Canada; Raymond H. Coe, Bridgeport, Conn.

CLASS II—BOYS IN ELEMENTARY SCHOOLS.

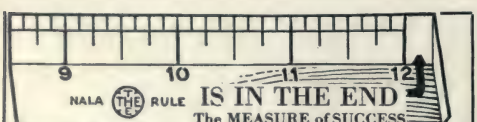
First Prize—Leonard Buckley, Providence, R. I.
Second Prizes—Robert Krummel, Kansas City, Mo.; Leonard Buckley, Providence, R. I.; Sloan Barclay, Pittsburgh, Pa.
Third Prizes—Roy H. Wisecup, Oxford, Ohio; Hearl Steele, Cashmere, Wash.; Henry Martin, Pittsburgh, Pa.; F. Wilfred Thompson, Avalon, Pittsburgh, Pa.; Ralph Hovey, St. Johnsbury, Vermont.
Fourth Prizes—Paul Sherry, St. Johnsbury, Vt.; George Hanny, N. S. Pittsburgh, Pa.; Edward Anderson, Texarkana, Ark.; Walter Shenk, Pittsburgh, Pa., two prizes; George Clement, St. Johnsbury, Vt.; James K. Ewart, York, South Carolina; Arthur Weinel, Pittsburgh, Pa.; John A. Johnson, Pittsburgh, Pa.; Paul Peacock, Little Rock, Arkansas.

CLASS III—BOYS NOT IN SCHOOL.

First Prize—John A. Sutterley, Mapleton, Kansas.
Second Prizes—Paul B. Kingsley and Oliver S. Kingsley, Cheyenne Wells, Colo.; Harold Hazen, Three Rivers, Mich.; Earl Alvers, Pomona, Fla.
Third Prizes—Vernor Nordberg, Duluth, Minn.; Hugo Saenger, Westboro, Wis., two prizes; Carlton H. Sprout, Montrose, Pa.; Charles Rook, Cuyahoga Falls, Ohio.
Fourth Prizes—Mello O'Neill, Darlington, Wis.; Loyd Parker, Essex, Conn.; Harold Hazen, Three Rivers, Mich.; Earl Boat, Pella, Iowa; Philip Keast, Grass Valley, Calif.; Kenneth L. Storch, Peotone, Ill.; Max Distelman, Newburyport, Mass.; Donald Bowman, Stuart, Iowa; Walter Roepke, Chicago, Ill.; Earl Shinn, Philadelphia, Pa.

It gives us pleasure to announce above the list of prize winners in our second prize contest, which closed December 31st. The number of contestants was very large, and shows widespread and growing interest in our prize contests. Many of the articles entered were very novel and ingenious, and their number and variety demonstrate the great ingenuity and capability of the American boy. Our next contest closes April 30th. Send to Dept. 3 for particulars and specification blanks.

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"The Saw Makers"
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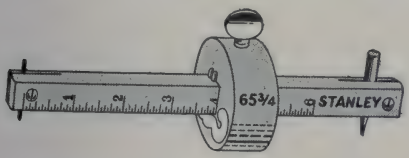
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TRADE NOTES.

During the next few months teachers and directors of manual training and industrial education will be giving considerable thought to the subject of new equipment for the coming school year. They have learned that early orders assure better service. It is disappointing to both students and teachers to be obliged to delay some of the work at the opening of school, pending the arrival of certain tools and supplies. Furthermore, manufacturers and dealers find it more comfortable to take care of orders when placed early. Manufacturers of equipment for metal-working have been working night and day for many months to take care of commercial orders, and it behooves the school people to govern themselves accordingly.

SOMETHING NEW IN WOOD GAGES.



It is not so common in this country as in France or Germany for schoolmen to lead in the improvement of tools and machinery. The manufacturers usually get their new ideas from workers in the industries instead of the schools. An exception to this is the case of the new Marking Gage No. 65¾ which has just been put on the market by the Stanley Rule and Level Co., New Britain, Conn. It embodies a new feature, consisting of a pencil inserted in the opposite end of the bar from the steel marking point. The idea was suggested by a number of manual training instructors in different parts of the country who had found in many instances that the steel point had a tendency to follow the grain on the wood being worked. The pencil is not apt to do this and in addition makes an easily distinguishable mark. Furthermore, should the student make a mistake the pencil mark can easily be erased and corrected, whereas a mark made with the steel point cannot be removed without re-surfacing the work. Both the pencil and the steel marking point are securely fastened by screws but can be adjusted for length and readily removed for sharpening.

(*Continued on p. XXVIII.*)

"YANKEE" TOOLS
Make Better Mechanics



Two Speeds
Changed by a little lever without taking drill from work.

Breast Plate
can be turned to right angle of position shown.

Two jaw chuck
for round or square shank tools.

Three jaw chuck
for round shanks only.

5 "Yankee" Adjustments
1st notch — Plain Drill
2nd notch — Left-hand Ratchet
3rd notch — Right-hand Ratchet
4th notch — Double Ratchet
5th notch — Gears locked (for changing drills)
Changed at a finger touch

"Yankee" Ratchet Breast Drill

Made for the tough jobs that you can't get at with ordinary breast drill, without taking apart the work. It operates in places impossible for other drills. The five adjustments of the Ratchet Shifter give you operating control that doubles your working capacity, saves time, saves labor.

With the Double Ratchet the drill cuts continuously with every move of the handle forward and back. No lost motion, every push and pull counts in the cutting. The accurate alignment of the jaws holds the drills absolutely centered.

"Yankee" Ratchet Breast Drill
Length 17 in.—Weight 6½ lbs.

No. 1555 — 3 jaw chuck
No. 555 — 2 jaw chuck
Price $5.25

Your dealer can supply you.

Write for "'Yankee' Tool Book," free for mechanics and householders. "'Yankee' Tools in the Garage" for Motorists.

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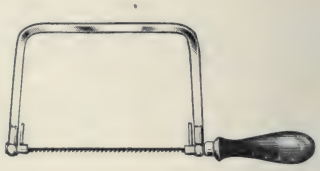
TRADE NOTES.

(*Continued from p. XXVII.*)

This gage is made of highly polished boxwood. The thumb screw is of brass and the bar is protected by a brass shoe placed between the bar and the head. The head is oval in form and a brass plate is set in the face to prevent wear. The bar is 8¼ inches long and is graduated in 16ths of inches for 6 inches from the point. This gage should prove a very useful addition to the small tool equipment of every manual training shop.

In these days of vocational training when the standards of technic are being constantly raised, the Fox "Universal Wood Trimmers" are in greater demand than ever before. The bench type is made in three sizes: No. 4A, 4 ft. high and 7¾ ft. wide; No. 5A, 4¾ ft. high and 7¼ wide; and No. 6A, 6 ft. high and 11¾ ft. wide. It is a very popular tool for light work, and for this reason makes a strong appeal for school use. In addition, the price is within the reach of every school appropriation. Fully descriptive circulars of their entire line will be sent to those interested by The Fox Machine Company, Grand Rapids, Mich.

There have been some important improvements made in the Mummert-Dixon line of oilstone grinders. These grinders are becoming more and more popular every year for school use. Their wide range of work, compactness, economy of floor space, and the convenience in operating make them very desirable. They are made with a removable automatic attachment for grinding knives. This attachment has been carefully designed to make it as light as possible, yet retaining the rigidity necesary for properly grinding the knives.



The above is an illustration of one of the latest products of the Millers Falls Company, Millers Falls, Mass. This firm has always made a specialty of saws for fret work of various kinds. Their No. 43 Coping Saw is a handsomely

(*Continued on p. XXX.*)



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At the Massachusetts Institute of Technology the use of the text book ADVANCED MACHINE WORK has doubled the efficiency of the course and reduced the instructors' work one half. 575 Pages, 609 Engravings. Price $3.00

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Rapid Progress
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PHILADELPHIA

See our Exhibit at
Hotel Ponchartrain, Detroit.

TRADE NOTES.

(*Continued from p. XXVIII.*)

finished tool, nickeled, with stiff spring steel back, and stained and polished hardwood handle. The direction of the blade is controlled by means of a pin at either end so that it is possible to do irregular sawing in various directions without removing the saw blade from the frame and readjusting it. The blade may also be locked in any desired direction by turning the handle up against the shoulder of the frame. The blade is strained in the same manner, that is, by turning the handle up against the shoulder of the frame. This is an indispensable tool for the carpenter or manual training student who has occasion to do those little fine sawing jobs where curves and angles must be cut.

The John Steptoe Company, Cincinnati, Ohio, manufacturers of shapers and milling machines, have issued a booklet on milling machine work showing operations that are performed in their own factory on their small hand millers and power feed millers. It is of special interest to machine shop teachers. The small shapers and milling machines manufactured by this firm are especially adapted for manual training work, the latter having all the advantages of the heavier type of tool. This is an old firm in the manufacture of machine tools, having been established isnce 1845. They will gladly send descriptive circulars of their machines to all who are interested.

The Oliver Machinery Company, Grand Rapids, Mich., manufacture a full line of woodworking and forge shop equipment, and they wish to place descriptive catalogs and bulletins in the hands of every prospective purchaser of equipment at once, in order to expedite the delivery of orders before the schools open in the fall. Orders can be placed now for delivery several months hence, and that at considerable saving in view of the continued advance in the prices of raw material. This firm is therefore urging immediate action in the selections of all school equipment.

That interesting and helpful booklet, "The Professor and the Saw," published some time ago by the Simonds Manufacturing Company, Fitchburg, Mass., ought to be in the hands of every manual training teacher or supervisor when he is selecting additions to his tool equipment to be

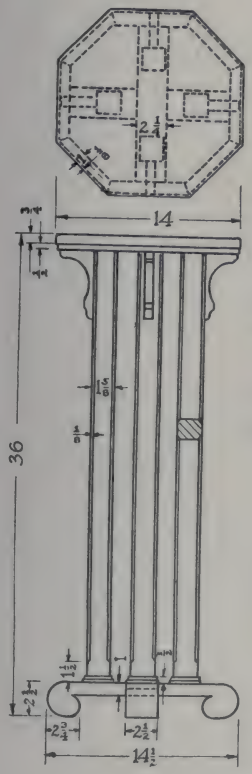
(*Continued on p. XXXII.*)

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On Tracing Paper Ready for Blue Printing



This is the second series of Shop Problems by Albert F. Siepert. It is uniform in size and style with Series No. 1 yet contains an entirely different set of drawings. It is a portfolio of drawings of projects printed on tracing paper and adapted to be blue printed for students' use. The plates are taken from the "Shop Notes and Problems" department of *Manual Training and Vocational Education* of the present volume. Among the distinctly new projects shown are three pieces of playground apparatus which can be made by high school boys for school playground use. The list includes the following:

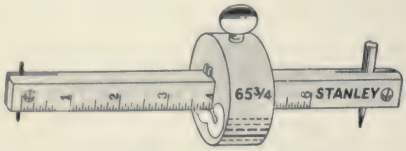
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PLANT STAND
OPEN BOOK SHELVES
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MUSIC CABINET
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OFFICE DESK
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DRAWING TABLE
DRAWING TABLE
DRAWING TABLE FRAME DETAILS
WREN HOUSE
CONCRETE FORM
PLAYGROUND SWINGS
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THE MANUAL ARTS PRESS, PEORIA, ILLINOIS

Stanley Tools



A New Stanley Marking Gauge

Designed especially for Manual Training use.

It embodies a new feature consisting of a pencil inserted in the opposite end of the bar from the steel marking point.

The pencil has not the same tendency to follow the grain as has the steel point, and in addition makes an easily distinguishable mark.

Furthermore, should the student make a mistake the pencil mark can be easily erased and corrected, whereas a mark made with the steel point cannot be removed without resurfacing the work.

We shall be very glad to furnish further details regarding this new tool.

Address

STANLEY RULE & LEVEL CO.
NEW BRITAIN, CONN. U.S.A.

TRADE NOTES.

(*Continued from p. XXX.*)

purchased this spring for present or future requirements. The company will send a copy of this booklet free to any instructor interested. The Simonds Company have a line of hand-saws, back-saws, coping saws, and pruning saws, which are especially suited to manual training school purposes.

Barnhart Brothers & Spindler, Chicago, Ill., whose announcement appears in our advertising columns, report a remarkable and growing interest among educators in this country in the installation of printing plants in the public schools. They have recently installed a $3,000 outfit in the high school at Hammond, Ind., and scores of smaller outfits have been put in by them during the past year. In nearly every issue of school papers nowadays are inquiries for information about printing supplies; the Barnhart foundry informs us that they have estimates and circulars that will supply all such information, and that this, together with any other assistance they can render are at the call of schools contemplating equipment.

Jewelry craftsmen who are familiar with the various precious and semi-precious stones will be interested in knowing that Anthony Espositer, of the Espositer, Varni Company, New York City, recently obtained a large piece of Brazilian topaz of a blue white color weighing over 5,000 carats which he cut into the shape and size of a goose egg. When finished it weighed 1,463 carats and had 444 facets cut on it. As far as known, this is the largest stone of its kind in existence. The booklet issued by this firm entitled "A Guide for Gem Buyers" is of interest to all jewelry craftsmen.

To teachers who desire to engage in commercial work during the summer vacation, the Kunkle Furniture Mfg. Company, Mackinaw, Ill., have an interesting proposition to offer. Particulars will be sent upon request.

"Teaching as a Business" is the title of a little booklet issued by The Albert Teachers' Agency, 623 S. Wabash Avenue, Chicago, Ill., which contains some pointed information that is valuable to every teacher. Several thousand copies have been called for by professors of education in universities and normal schools who have used it as a supplementary text in their classes.

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Lettering; Freehand and Mechanical. Equipment; Formation of Letters; Spacing; Titles.
Use of Instruments. Drawing-Board; Paper, Border Lines; T-Square; Scale, Needle Point; Triangles; Pencils; Erasers; Cleaning Pads and Blotters; Drawing Instruments; Ink Bottles; Protractor.
Orthographic Projection. Principles of Orthographic Projection; Permissible Violations; Auxiliary Planes of Projection; Third and Fourth Views of a Working Drawing.
Working Drawings. Detail and Assembly Drawing; Detail Working Drawings. Order of Pencil Work; Dimensioning; Sectioning; Tracing.
Fasteners. Threads; Conventional Representation of Threads.
Shop Terms, Tools, Machines. Draftsman's Use of Shop Terms; Finish; Drill, Bore, Ream; etc.
Isometric and Oblique Projection. Principles; Isometric Scale; Irregular Objects; Oblique Projection; Axes and Co-ordinate Planes; Dimensioning; Oblique Scale; Circles; Irregular Objects; Shades and Shadows; Principles.
Machine Sketching. Paper; Nature of Drawing; Pencil-Sketch Stroke; Size of Drawing; Procedure; Short Cuts.
Perspective. Perspective Drawing; Principles of Construction; Picture Plane and Position of Object; Position of Point of Sight; Principal Point in Perspective; The Horizon in Perspective; Mechanical Construction of a Perspective, etc.
Appendix. Photographic Reproductions; Blueprinting; Engraving Processes. Half Tones; Abbreviations Used in Drafting; Reference Tables; Conventional Standard Symbols Used by Architects and in Electrical and Automobile Construction, in Hydrographical and Topographical Drafting and Structural Drafting, Patent Office Drafting, etc. Bolts and Nuts; Screws; Pipe Threads; Shop Operations. Keys and Keyways.

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AFTER HOURS

SEEKING RED APPLES HE FOUND YELLOW PEARS.

A FEW days after the Minneapolis Convention I met my friend Harrington who questioned me concerning the trend of discussion at the meeting. He was especially interested in what I told him of the spread of the junior high school idea and of the approval of prevocational training in general. Then he asked whether there was any indication that public trade schools were developing as rapidly. When I answered in the negative he said:

"That reminds me of a dream I had two nights ago. I seemed to be back on the old New England farm again where I spent my boyhood days, I recalled the red sops of wine apples I used to find on a certain tree in the big orchard. I started to find the tree, climbed over the stone-wall at the low place, just as I used to do, and found myself in a field of very tall grain. I looked for the old path to the apple tree. I found what seemed to be the right one, but it was not very clearly defined. I followed it thru the grain that was higher than my head, and straightway found that the path led to a pear tree which was heavily laden with those delicious yellow pears which I used to like very much better than the red apples. I at once lost my desire for apples and sat down and began to eat the pears that had fallen to the ground. Just then I awoke."

THE PRAIRIE STYLE.

YOU say you love the mountains; so do I, and I love the prairie, too. The aspiring, broken lines of the mountains suggest strength and force and action; the horizontal lines of the prairie give repose and imply unbounded possibility. The spirit of the prairie has been slower to find expression in art but we see it coming. The painters are catching the idea, and the landscape gardeners are promoting it. By the repetition of horizontal line of land or sky by means of plants which have strong horizontal branches or flower clusters, like certain hawthorns or thorn-apples, the art of the prairie is coming into being. Since 1901 one landscape gardener has done work in Illinois and nearby states amounting to $6,000,000, which he says was "inspired by the prairie." The prairie style is suitable only for the Middle West and is especially so for Illinois which is the "prairie state."

To further this style of planting, the College of Agriculture of the University of Illinois has issued a circular (No. 184), written by Professor Wilhelm Miller, entitled "The Prairie Spirit in Landscape Gardening." To anyone who agrees to do some permanent ornamental planting within a year the University will send a copy of this circular free of charge.

USED HIS HEAD AS WELL AS HIS HANDS.

VALENTINE JOBST, now a prominent citizen and wealthy contractor in Peoria, came to America in 1854. He had learned the trade of a mason in Germany. Because work at his trade was scarce that first year young Jobst was obliged to seek ordinary day work. His first job was helping excavate for a small cottage which was being erected. As was sometimes the custom, the walls of the house were being put up while the excavating work was still in progress. After the walls were in place the excavators discovered a large granite boulder in the middle of the basement. Of course the stone must be taken out. The man in charge of the construction was puzzled. Finally he went away, and hired three stone cutters to come the next day and cut the big rock into pieces so that they could be carried from the basement.

Meanwhile Jobst looked on without saying anything. In fact, he couldn't have said much anyway for he had not yet mastered the English language. But he was thinking. After the boss had left, Jobst set two men to work digging a deep hole in the basement, close up to the boulder. When the hole was deep enough he rolled the stone into it by means of a pinch-bar. Then he covered it up. The next morning the boss came early with the three stone cutters and was amazed to find that the stone had disappeared.

The weekly work day breaks in upon the study but wakes up the mind. More actual progress can be accomplished with it than without it.

—General Armstrong.



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VOLUME XVII NUMBER 8

MANUAL TRAINING AND VOCATIONAL EDUCATION

APRIL, 1916

IS "PREVOCATIONAL" A NEEDED OR DESIRABLE TERM?

FREDERICK G. BONSER

THERE is expressed and growing dissatisfaction with the term "prevocational." In general, it refers to school work for boys and girls of twelve to fourteen or sixteen who expect to leave school at fourteen, fifteen, or sixteen to enter industrial, commercial, or agricultural vocations. Work of the same kind is often found in "vocational" schools, "intermediate industrial" schools, "shop" schools, and "junior high" schools, or even "junior" schools. It is usually presumed that the *specific* vocation to be followed has not been chosen, but that choice of a *general* field—industrial, commercial, or agricultural—has been made. One purpose of the work much emphasized is that of the "trying out" of the more important divisions of the general field that a specific kind of work may be found most suitable for each student and some definite, preliminary training given for more efficient entrance into the selected line of work. Parallel with this kind of work, about half time is devoted to supplementary and general education subjects. There is no question of the need and desirability of such school programs, but is "prevocational" the best term for indicating them? In many instances the term would just as well fit the courses of the manual training, technical, or general high school courses, or even numerous college courses. In these higher schools, the purpose and function of many programs are, so far, less consciously, yet actually, much the same.

Why is there need for such a term to apply to these two or three years of work beyond the elementary school period? Is not the work really of a secondary school character? Do not all such schools, at least

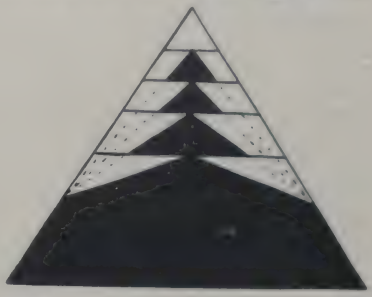
theoretically, offer as a part of their work some of the usual secondary school subjects? Are not the courses of such schools but an organization of work in relationship to the need of *their* pupils comparable to the organization for pupils in other courses in relationship to *their* needs? Is not the junior high school idea adequate to include this phase of work as a valid branch or division within its proper organization? The work is, or should be, regarded as secondary—resting upon the foundation of the elementary school. If, by any possible stretch of imagination, we can think of a really democratic secondary school plan—one offering opportunities adapted by its differentiated courses to prospective industrial, commercial, and agricultural workers equally as well as to prospective professional workers—then our so-called "prevocational" and "vocational" courses would find their places as an integral part of the junior-senior secondary school organization.

No question whatever is here raised of either divided or unified administrative control. It is here desired to focus attention upon that educational and social unity which should underlie a plan of democratic educational opportunity. There may be implications as to administrative organization but these are not here the point of discussion. Pupils who must, by limitations of capacity or economic conditions, become wage-earners at fifteen or sixteen are just as much entitled to appropriate preparation for their entrance into vocational life, so far as is possible, as those who may postpone entrance to vocations until the age of eighteen or twenty or twenty-four. Breaking up the secondary stage of education into a variety of separately organized, unrelated, and variously named schools is not only wasteful and undemocratic but it is unnecessary.

Knowing full well that it will be regarded as impractical, visionary, theoretic, and idealistic, I venture, however, to offer a diagrammatic representation of a unified school system which could provide opportunities equally valuable for all normal children, whatever their vocational destination, in so far as we are able to organize work in terms of vocational-social needs.

The shaded areas of the pyramid indicate the proportion, roughly, of work that should be common to all up to the point of withdrawal from school for entrance upon vocations, wherever this may come—at sixteen for those entering the lower grades of non-professional work or at twenty to twenty-five for those entering the professions. The unshaded areas represent the differentiated work in each of the respective stages of the school system. Six years with work the same for all may be regarded

as fundamental, the least possible common denominator of experience consistent with the development of a national, unified life. For those who must get on with a minimum beyond this, the junior high school



PRESENTATION OF A UNIFIED AND COMPLETE SCHOOL SYSTEM.

From the elementary school foundation, common to all, work is about one-half in common in the junior high school, about one-third in the senior high school, and progressively less through the college years, becoming almost, if not quite, zero in the higher professional schools. The differentiated work, about one-half in the junior high school, increases progressively through the higher schools. By withdrawal to vocations, the number of students diminishes with each succeeding period.

of three years gives about half of its work as common to these and all other students. The remaining half is to be organized into groups of differentiated courses appropriate to the purposes and needs of the several groups of students. This half of the work may be directed as pointedly as seems wise to the vocation to be entered at the close of the period for those who can not longer continue, and adapted equally well to the different needs of those who will continue longer in school. Those remaining through the senior secondary period would have a little less than half in common, still greater differentiation following than in the junior secondary period. As shown by the shaded areas, in the junior and senior college years there is some work in common for all continuing, though in diminishing amount. Opportunities and needs for differentiation and specialization grow increasingly as seen in the unshaded areas of these periods. Following the college courses are the two or more years of highly specialized work of the distinctively professional schools where there may be nothing desirable as common in their various curricula.

These several intervals indicated correspond fairly closely with periods of vocational entrance, although the diagram makes no attempt

to show the proportionate numbers withdrawing at the close of each period.

When the elementary school comes to be that true reflection of life needs and activities for which we are so persistently striving, its work will be as largely "prevocational" as is that of the "prevocational" schools. Indeed, let us hope that it will be more so. With all of the activities typical of vocational life in our time, and with the wealth of vocational information and insight which the elementary and secondary schools may develop there will certainly disappear the need for any specialized types of schools called "prevocational."

Is not the development of the great variety and number of specially labeled secondary schools a most scathing indictment of our "regular" schools and school men? Is it not an evidence that they have been blind and deaf to the decades of progress and the crying needs of the fifty or sixty or seventy-five per cent of pupils who "drop out"? Their passive verdict has been, "Let them drop. The 'regular' school is no place for them." What is a "regular" school for, anyway? Why not "regularize" all schools for regular pupils, excepting those only who are really atypical?

The differentiated courses in the junior high school may need designating terms—junior industrial course; junior commercial course; junior agricultural course; junior general course; and perhaps some others. Under this organization the junior industrial course may offer just as appropriately as the "prevocational" school the "trying out" or "finding" features desirable in making specific vocational choices, together with just as much definite preparatory training as is reasonably profitable. If regarded as appropriate, the junior general course may be differentiated into the junior classical, the junior scientific, the junior modern language, or other course groupings. The aim and the virtue of the junior high school plan are its flexibility and adaptability to meet the needs of all normal children for the two or three years following the elementary school period. Does not this plan meet all of the needs of the "prevocational" school and remove any necessity for a separate development and a separate term?

THE VALUE OF A TEXTBOOK IN MANUAL TRAINING WORK.

CHARLES WILLIS CLARK.

THE suggestion to use a textbook is intended for the teacher of woodworking in the secondary school (or in the vocational school) where the classes meet for at least one hour and a half daily. It might with modification be applied in principle to other branches of manual training work. It is clearly impossible to do any book work with the elementary classes meeting only an hour or so weekly, nor is it necessary. There the pupil's individuality is lost in the organized class work, and each demonstration of the teacher may be followed more directly by application on the part of each pupil. More advanced classes, however, meeting daily for a double period, even if one-fourth of the time is spent in correlated mechanical drawing, still have time which may be profitably used in study of tools, methods and processes of construction, growth and selection of wood, best methods of finishing, and kindred subjects that will serve to give the pupil a broader knowledge of the practical things of everyday life, thus aiding in his general culture.

The pupil in the high school woodworking class has gained some knowledge of essentials in the grades, and perhaps has demonstrated his ability to use tools in a workmanlike way. It is only just to afford him an opportunity to use his individuality on some project of his own choosing and design. But it is just here that the teacher meets a difficult problem. He is teaching a class of perhaps twenty students, no two of whom may be working on a similar project. Demonstration followed by application directly on the part of each student is impossible. One may be working with housed joints, another with dovetails, another with mortised pieces. Under these conditions many teachers give little better than a hopeless, haphazard type of individual instruction. Some boys will get important information that others miss entirely, and the teacher becomes discouraged in the attempt to give each boy even some small part of the knowledge he should have when he has finished his woodworking course.

It is clearly not enough that a boy shall have completed successfully the building of one or two pieces of furniture, with repeated proddings and constant supervision on the part of the teacher. He should also

have acquired knowledge of tools and their uses, of the best methods of construction, of the varieties of wood and what is good wood and what is bad wood. In all, he should have a working knowledge of woodworking, so organized that he can meet successfully a repair or construction job that is within the power of a practical man.

Let the boy become acquainted with standard works on the subject of woodworking; have them put in the school libraries. He will then know how to go after intelligently what he wants to know concerning the problem that he must solve.

The writer would not advocate an atmosphere of bookishness for a course in manual training. That would be an argument against the use of a text in a woodworking course. The textbook work may be so conducted that it will be very interesting for the pupils. The writer has had his boys tell him that the course in woodworking has risen mightily in their estimation since they had acquired the deeper knowledge of it, due to better organized study. Thus the use of a textbook induces the more deserving type of boy to elect manual training, when he has hitherto shunned it as not quite on a par with the usual college entrance subjects. At the same time it acts as a check upon the lazy type of boy who thinks he sees a "cinch course," an opportunity to do pretty much as he pleases, to make what he wants to and loaf on the job as long as it will mean the acquisition of a few more credits toward graduation.

GROUND TO BE COVERED BY A TEXT.

The writer has used only one of the excellent texts that can be obtained, thus far, owing to the red tape necessary to get a new one adopted. The material in this one is good, but it is poorly arranged. It is necessary to start in the middle of the book to get what would logically come first in a course in woodworking. It is the writer's opinion that there is a certain sequence in which these topics may be taken up, following naturally the order of the operations in the shopwork.

Perhaps first in the series would be a chapter on the fundamentals of mechanical drawing, the construction and design of the project, and the working out of the bill of stock. A chapter then on an efficient way of getting started on a job will be of much help to the student, and save the teacher much tedious coaching on what should become essentially the usual and habitual. Such principles as these—work from a

common starting point, and complete all similar gagings at the same time—would be included in the chapter under discussion. By thus giving the pupil some idea as to how to work systematically, he would be started on the road to greater efficiency.

The following chapters would take the material of this second chapter and discuss it more in detail under such titles as: (1) Tools, points in their construction, how they are used and kept in condition. The discussion of tools would logically come first, and would fall under the simple classification of measuring tools, cutting tools, boring tools, etc. (2) Wood, its classification, growth, seasoning and selection. (3) The standard joints, how marked out, and how cut. (4) Wood finishing, stains, filler, varnishes; their composition and application.

This material might be well covered in a term of twenty weeks, giving one period a week to it. The work may be reviewed by occasional short tests which will serve to fix the subject in the pupils' minds. Perhaps it is best, however, to avoid the formal final examination.

The second term a study of kindred subjects would be taken up, such as the manuufacture of materials used in manual training, screws and other hardware, glue, tools, machines, varnishes. This might be satisfactorily supplemented by visits to neighboring factories, and again by solving problems the boy meets in his home life, such as methods of repairing furniture.

The aim then of the textbook is not to alter the original purpose of the course, but to organize and systematize the work covered in order that the pupil may have a well ordered knowledge of what he has worked out with his hands.

THERE ARE ONLY TWO KINDS OF EDUCATION. I SEE NO OTHER DIVISIONS. PEOPLE TALK ABOUT VOCATIONAL AND CULTURAL, TECHNICAL AND PROFESSIONAL, ELEMENTARY AND POST-GRADUATE, THEORETICAL AND PRACTICAL, AND MANY OTHER SIMILAR DIVISIONS. I SEE NO REAL DISTINCTION EXISTING IN ALL THESE. THERE IS ONLY ONE DISTINCTION WHICH COUNTS. THAT IS THE DISTINCTION BETWEEN SCRATCHING THE SURFACE AND DIGGING TO THE ROOTS

—Henry N. MacCracken.

MANUAL ARTS LESSON PLANS.[1]

R. H. Rodgers.

SUCCESSFUL teaching demands daily preparation. Preparation should at least consist of a mental or, much better, a written analysis and organization of the subject-matter and processes involved. Too often do we find the shop or drawing teacher after calling the roll sending the members of the class to their benches, machines, or drawing tables to continue the work of yesterday. The work of the day has apparently been given no thought until the class appears. In some cases teachers should have the assistance of the supervisor; in many others a realization of their shortcomings will result in an effort to better their methods of teaching. To meet a situation of this kind a thoroly practical type of lesson plan is advanced as the medium that will insure more effective results.

Despite the tendency of many teachers in general, and manual arts teachers in particular, to regard the lesson plan as a piece of pedagogical bric-a-brac to be used sparingly in actual practice, it has most commendable elements for both new and experienced teachers. It is not offered as the panacea for all poor instruction, but a good lesson plan does demand on the part of the teacher the ability to analyze both subject-matter and processes. In any piece of instruction for a day's work or longer the teacher should have met each step and problem involved, constantly weighing the material with reference to its relative value. Preparation of the lesson plan demands also the ability to organize the selected subject-matter and processes with due regard for their logical order and pedagogical significance, care being exercised not to force adult organization on immature students. The ability to handle these two phases of the teaching process is distinctive, in part, of the trained teacher in comparison with journeymen workers without pedagogical training. The lesson plan's greatest value lies, then, in the training it gives the individual teacher in the analysis and organization of teaching material for class instruction. Supervisors should make a much more extensive use of this old device, since it is known that its proper use means more efficient teaching.

There is a general similarity in the forms of lesson plans advocated by most educators engaged in the training of teachers. The type developed by Dr. L. D. Harvey, and used continuously by him for a number

[1] Copyright, 1916, R. H. Rodgers.

of years, is characterized by its simplicity, directness, and adaptability to industrial subjects. In presenting this type for consideration it is known very definitely what may be expected from its proper use, not in theory but from many years of actual practice.

The elements or propositions which make up this type of lesson plan are:

I. The teacher must have clearly in mind the purpose or purposes to be realized in the class period.

II. The teacher must have clearly in mind what must be known and done in order that the purpose or purposes may be realized.

III. The teacher must determine what of the things that must be known and done the pupils now know and can do.

IV. The teacher must determine the things remaining to be known and done and the order in which they shall be known and done.

V. Method of presentation.

Under proposition I, the purpose or purposes should be stated clearly and directly to the point, using as few words as will adequately express the aim of the teacher. Propositions II, III and IV include the complete analysis of the problem to be taught and also the organization of the material into its logical order. It might be compared to a sifting out process, leaving as a residue under proposition IV only those things which the teacher must present and the order in which they will be taken up. Proposition V is concerned with the method of presentation—that is, how the teacher brings the material to be taught—before the class for instructional purposes. This requires a good working knowledge of the principles of teaching and numerous pedagogical kinks and devices.

In general, a presentation on the part of the teacher may be made in any one of the following four ways: (1) by means of a lecture or talk aided, possibly, with illustrative material; (2) by the developmental method, using either the inductive or deductive approach; (3) a demonstration by the instructor before the class for the purpose of illustrating good practice or new processes; (4) a combination of the three methods enumerated. This latter might be termed the objective-developmental method. It takes the demonstration, which is fundamental in teaching industrial processes, and supports it with good, clear-cut explanations in the form of a lecture or talk, and further strengthens it by the use of carefully selected questions, thus concentrating attention and taking into account self-activity on the part of the student.

The lesson plans which follow are selected from the most common lines of industrial work being taught in the public schools, and follow the form submitted very closely. Some of the plans cover a complete problem, in which case they are called "unit plans." Others cover only a portion of a project or exercise, and are known as "day plans." In this connection every project should first be considered as a whole and the day plans worked out from it. The majority of plans submitted are of the latter type.

DAY LESSON PLAN.

SECOND YEAR HIGH SCHOOL MECHANICAL DRAWING.

Use of Tracing Cloth.

I. Purposes:

1. To have students understand the function and proper use of tracing cloth.
2. To have students gain experience in using same.

II. It must be known that:

1. Tracings are the means commonly utilized in commercial practice to secure copies of drawings termed blueprints.
2. Tracing cloth has one surface glazed and the other unglazed.
   a. The glazed side should be used if very clean lines are desired, if any erasures are to be made, or if there is a tendency to soil the tracing.
   b. The unglazed side should be used if penciling is to be done or photographs to be taken.
3. Tracings should be made, in general, by tacking the cloth over the pencil drawing.
4. Tracing cloth should be dusted by means of a blackboard eraser, or with a special preparation to remove dirt and grease preparatory to inking.
5. The T-square, triangles, and instruments should be used as follows:
   a. Head of T-square should always be squarely against left edge of drawing-board, and all horizontal lines drawn along the upper edge from left to right.
   b. Triangles should be used for all vertical lines and all others except horizontal lines and curves; drawing to be done along left edge and away from body.
   c. Enough ink should be placed in the ruling- or bow-pen by means of the quill in the ink bottle to extend back $\frac{1}{4}''$ on the nibs.
   d. In drawing straight lines the ruling-pen should be held in a plane vertical to the drawing and inclined slightly to the right, the line being drawn about $\frac{1}{32}''$ from edge of square or triangle.
   e. All arcs and circles should be inked first.
   f. The weight of the various lines should be as follows: heavy lines for the outside of the figure; dotted lines of hidden surfaces a degree lighter; and dimension lines, construction lines, and others still lighter.

6. Care should be taken to let ink dry thoroly before moving square or triangles over surface of the tracing.

7. Tracings should be accurately executed since they are the master drawings.

III. Steps that are known and can be done by students:

Points enumerated under II, 5.

IV. Steps remaining to be taught and their order:

Points enumerated under II, 1, 2, 3, 4, 6, 7.

V. Method of presentation:

NOTE:—Numbers refer back to II.

1. Instructor informs class that in commercial practice a master drawing, termed a tracing, is made, from which any number of copies called "blueprints" may be taken.

2. Inform class that tracing cloth is a good grade of linen, or some other fine thread fabric, sized with a starch preparation on one side making it transparent and capable of taking ink. Show advantages of both glazed and unglazed sides; also advantages of cloth over paper which is used a great deal for same purpose.

3. Show how cloth is stretched over pencil drawing, care being taken not to crack or fold it.

4. Have students feel surface of cloth and call their attention to dirt and grease, and the necessity of using chalk or some preparation to remove it before inking.

6. Explain to students why ink dries more slowly on cloth than on paper, due to the sizing which keeps it from penetrating.

7. Explain why it is absolutely necessary that tracings be carefully executed, in that from them the prints are made from which in turn the work is carried thru to completion.

For the sake of economy the wording of the five fundamental propositions is cut down to a bare statement of what each stands for, also all duplications of statements are avoided by the use of back references. A close analysis of the elements of the above plan shows that there is a well-defined purpose broad enough to cover both the technic and the educational aspect. Under II are found all those things that must be known and done by the student in order to accomplish the stated purposes. Proposition III eliminates a great deal that is found under II, since at this stage in the student's progress he has had considerable experience with drawing instruments. This elimination leaves just those things which the teacher must teach, which proposition IV takes account of. The method of presentation states definitely just how the teacher is planning to bring the new subject-matter and processes before the class, doing away to a large degree with much of the hit-and-miss type of instruction that prevails at the present time.

In the plans that follow, no analysis should be necessary if the general scheme has been comprehended and the preceding plan closely studied.

DAY LESSON PLAN.

ELEMENTARY WOODTURNING.

Turning a Cylinder.

I. Purposes:

1. To have the students understand the function of the turning lathe, its use and care, and the principles involved in the use of the gouge and the skew chisel.

2. To have the students gain experience in placing a piece of stock 1¾″ square and 8″ long in the lathe between centers, and turning it smooth and straight with the above-named tools kept in proper condition.

II. It must be known that:

1. The function of the woodturning lathe is to turn out circular and cylindrical work.

2. For high-speed woodworking machines certain cautions must be observed:
   a. All bearings must be clean and well oiled, especially the spindle bearings.
   b. Spindle must run true, necessitating proper adjustment of bearings, and elimination of end play.
   c. Belts must be sufficiently tight to drive machines efficiently.

3. Stock to be turned between centers should first have centers located by drawing diagonals on the ends; at the intersections make a hole with a scratch-awl.

NOTE:—Soft wood is preferable for beginners.

4. The part of the lathe containing the drive is called the "head-stock," and the steel center inserted in the hole in the end of the spindle is variously termed the "live center," the "driving center," or the "spur center."

5. The part containing the other center, called the "cup" or "dead center," since it does not revolve, is termed the "tail-stock." It slides backward and forward on the bed, and is made stationary by means of a clamp.

6. To place stock in the lathe preparatory to turning:
   a. Centers should be put in place in the head- and tail-stocks.
   b. Stock with the centers located should be driven on the spur center so that the spurs enter about ⅛″.

NOTE:—The spur in many cases is driven into the stock before being placed in the lathe.

   c. Tail-stock should be moved along on the bed so that the center is within 1″ of the stock and clamped; hand-wheel should be used to advance the center into the stock about ⅛″. The center should now be run back slightly, heavy oil applied, and again run back into the stock and secured by means of the locking clamp.
   d. Stock should be revolved by means of the hand on the belt or pulley until it moves freely; adjust the rest to clear the corners of the revolving stock by about ⅛″, and approximately ⅛″ above the center of the stock, and clamp securely.

7. The speed of the lathe should be adjusted by the instructor.

NOTE:—Determination of speeds and methods of shifting belts are left to subsequent lessons, as over-crowded lessons and demonstrations lose much of their value.

8. Lathes should be started by throwing the belt from a loose to a tight pulley on a counter-shaft, throwing in a clutch, or throwing in a switch.

9. The student, preparatory to turning, should:

   a. Assume an easy and natural position, with feet apart, before the lathe, and in such position that it will permit him, if turning a short piece, to make cuts in both directions thru the entire length without movement of the feet.

   b. The gouge should be held with the bevel down, right hand close to the end of the handle, and left hand with back up, thumb over, about 2″ from cutting edge.

10. The gouge should be held easily but firmly on the top of the rest, with the left hand so adjusted that it acts as a guide on the lower side of the rest while working backward and forward.

11. In making first cut, which should be to remove the corners on both ends, the cutting edge should make a tangent with the revolving surface, and at such an angle that the shavings fall clear of the operator.

12. Main cut should be started about 1″ from either end, and run out at the other end of stock, the tool being constantly held tangent while repeating this from both ends. The cutting should be done almost entirely by the sides of the gouge being rolled against the surface of the revolving piece rather than being pushed directly into it.

13. Operations should be continued until the piece is perfectly round, when the skew chisel should be used for the smoothing.

14. The skew chisel should be held in the hands similarly to the gouge, the cutting being done on the lower half of the sharpened edge toward the obtuse angle, or, as it is sometimes called, the heel.

15. The cut should be started about 1″ from either end and run out at the other end, the cutting edge coming in contact with the revolving surface at a tangent. To secure this tangency the tool cannot be held flat on the rest but the opposite edge from the cutting section must be raised on the rest.

16. To take a cut in the opposite direction the tool should be turned over and held in the same manner as for the first cut.

17. These operations should be continued until the piece is smooth and straight.

18. The gouge when dull should be sharpened by means of a slipstone:

   a. Place a drop or two of oil on the stone.

   b. Hold the gouge stationary in the left hand—handle under the left arm—and whet the beveled side of the gouge with a circular motion until an edge is turned; then use slip on the inside of the tool until the wire edge is removed.

19. The skew chisel may be whetted on the ordinary oilstone in the usual way, or with the slip in a similar manner as used on the gouge.

III. Steps that are known and can be done by the students:

The subject is new hence the students are not familiar with any of the points.

IV. Steps remaining to be taught and their order:

All the things or points in the order enumerated under II.

V. Method of presentation:

NOTE:—Numbers refer back to II.

1. Instructor explains briefly the function and the importance of the lathe in a woodworking establishment.

NOTE:—The evolution and development of the lathe should come later in the course when the student's experiences will permit him to appreciate more fully what this means.

2. a. Show where the various parts of the lathe must be oiled, and explain what happens when they are not cared for.
   b. Explain the results of the spindle not running true.
   c. Show how to tell when belts are sufficiently tight.
3. Show how to locate the centers on a piece of stock that is to be turned.
4. Call attention to the parts of the lathe that constitute the head-stock.
5. Call attention to the parts of the tail-stock.
6. a. Demonstrate the putting of the centers in the head- and tail-stocks and explain why they are so located.
   b. If soft wood is used demonstrate the driving of the piece on the spur center; show also the driving in of the center before it is located in the head-stock. Question: What is the disadvantage of the first method?
   c. Show how the tail-stock is moved into place, and clamped, and the center run into the stock and oiled. Question: Why is it necesary to oil the dead center?
   d. Demonstrate how the stock is revolved until loose enough to run freely, and the adjustment of the rest.

7-8. Demonstrate the starting of the lathe, and the cautions to be observed.

9. Explain advantages of an easy, natural position in front of the lathe. Show very definitely the position of the hands in grasping the gouge, and then test your showing by having several students do it.

10. Show very clearly the position of the tool and the hand on the rest, and have certain students take the proper position. Question: What would happen if the tool is not held securely on the top of the rest?

11. Explain why first cut is usually to remove the corners of both ends.

12. Show by blackboard sketches and on the actual work what is meant by tangency. Show by comparison the difference between the scraping and the tangent cuts.

13. Demonstrate the turning of the piece until perfectly round, and show how to tell when it is in that shape. Caution students that the hand is placed on the stock on the opposite side from the rest in feeling the revolving piece.

14-15-16. Explain definitely why the cutting section of the skew chisel is the lower half toward the heel. Show clearly how the chisel is held and reversed for the return cut. Constantly emphasize the tangent cut.

17. Show how to test the piece for straightness, and what is meant by smoothness.

18. Demonstrate the sharpening of the gouge, and have certain students illustrate.

NOTE:—The tools should first be given to the students ready for use and then, as they become dull, and there is a need for the sharpening, it should be demonstrated.

19. Demonstrate the whetting of the skew chisel, and impress on the students that time spent in the sharpening of tools is time economically used.

DAY LESSON PLAN.

HIGH SCHOOL CARPENTRY.

Preparing Rough Flooring.

I. Purposes:

1. To have the students understand the operations involved in cutting one end of diagonal floor lining preparatory to laying the floor.

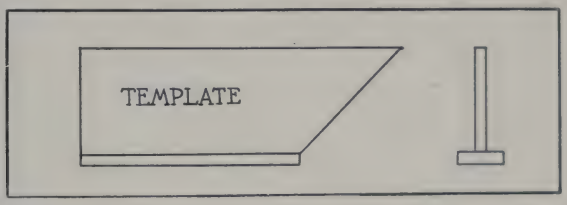
2. To have the students gain experience in performing the above operations, and also in piling lumber in neat stacks.

II. It must be known that:

1. The floor lining should be laid diagonally on the joists, necessitating the cutting of one end at 45 degrees.

2. The lumber to be used for the floor lining is of various widths and lengths.

3. The saw-horses should be placed and then as many boards as possible placed on them without stacking one on the other.



PATTERN FOR CUTTING FLOOR LINING LAID DIAGONALLY ON JOISTS.

4. A pattern from which to mark one end at 45 degrees should be made by laying out the angle with a steel square on a board wider than any of the material to be cut. Saw off on the line and nail a strip as a guide along the edge that forms an obtuse angle with the 45-degree cut.

5. All the boards on the saw-horses should be marked from the pattern, care being taken to economize on material.

6. All the boards on the horses should be cut with a crosscut-saw, each cut being started from the edge of the board forming an obtuse angle with the 45-degree line.

7. In sawing off material at an angle, care should be exercised to always have the saw at right angles to face of the board.

8. Boards after being cut should be taken from the saw-horses and neatly piled according to length and width.

III. Steps that are known and can be done by the students:

Points enumerated under II, 6, 7.

IV. Steps remaining to be taught and their order:

Points enumerated under II, 1, 2, 3, 4, 5, 8.

V. Method of presentation:

1. Explain the advantages of laying floor lining diagonally on the joists; that it stiffens the entire framework by acting as braces.

2. Call attention to the lumber pile with its boards of various lengths and widths, and explain the reason for that condition.

3. Explain economy of time in placing boards in a systematic way on the saw-horses, and refer to tendencies in this direction in modern industry.

4. Make a pattern before the class, and demonstrate the use of the steel square in laying out the angle. Have different students try the laying out of angles before the class. Demonstrate and explain a few of the many other uses of the steel square.

5. The teacher marks several boards before the class, showing how to economize on time and material.

8. Demonstrate the piling or stacking of boards after cutting; arrange stacks according to width and length of boards.

DAY LESSON PLAN.

HIGH SCHOOL FOUNDRY.

Making a Simple Mold.

I. Purposes:

1. To have the students understand the processes involved in making a mold for a solid casting from a one-piece pattern with a plain cope.

2. To have the students gain experience in molding the same, involving the proper use of the molder's tools and appliances.

II. It must be known that:

1. Molding sand must be free from all foreign substances, wet enough to compress firmly in the hand, and evenly mixed.

2. A two-part flask, which is a wooden or an iron box to hold the sand, with bottom and follow boards of a size suitable for the pattern, should be selected.

3. The follow board should be placed on the floor, bench, or stand, and on it the drag half of the flask with the sockets down.

4. The pattern should now be centered in the flask, care being taken to see that the cope side of the pattern is against the follow board.

5. A riddle full of sand should be shaken into the flask and packed around the pattern with the fingers to insure a firm edge.

6. The flask should now be filled with sand by means of a shovel, and rammed with the thin edge of the hand rammer, first around the edges of the flask and then over the remaining surface.

7. Flask should again be filled with sand and rammed somewhat lighter than before with the butt end of the rammer, following which the surplus sand is removed with a strike-off stick, enough sand being left to permit the bottom board to be rubbed down firmly.

8. Mold should be vented by pushing a small wire several times into the flask of sand, care being taken to put in enough openings, and also not to drive the wire down against the pattern.

9. The bottom board should be rubbed into place clamps being put on over both boards if necessary and the flask rolled rather than lifted over.

10. The follow board should be removed, and the parting slicked up if necessary, and then sprinkled with parting sand to insure a free parting.

11. The cope flask should be placed on the drag, care being taken to see that the pins and sockets match.

12. A sprue pin with the small end down should be set in the face of the drag a short distance from the pattern and as far from the edge of the flask as possible.

13. A riddle of sand should be shaken into the cope flask and packed over the pattern, followed by the ramming, striking off, and venting, as previously directed for the drag.

14. The sprue pin should be drawn and the cope flask lifted off.

15. The sand should be blown out of the sprue pin hole and the edges of the hole in the top of the cope flask pressed down firmly with the thumb.

16. The lifting pin should be driven into the pattern and tapped lightly on the sides to start the pattern from the sand.

17. After drawing the pattern the gates should cut from the sprue pin mark in the face of the drag to the mold, care being exercised that the gates are neither too heavy nor too small.

18. Plumbago or some similar preparation should now be shaken on the surface of the mold.

19. The mold should now be closed up, clamped, and set out on the floor preparatory to pouring.

III. Steps that are known and can be done by the students:

The subject is new hence the students are not familiar with any of the points.

IV. Steps remaining to be taught and their order:

All the points in the order enumerated under II.

V. Method of presentation.

NOTE:—The numbers refer back to II.

1. Demonstrate how to tell when the sand is in proper condition for use.

2. Explain why the flask must be considerable larger than the pattern, to prevent the flask, if a wooden one is used, from burning, and also to provide space for the sprue pin.

3. Inform the students of the necessity of placing the follow board level on the floor or bench; also the distinction between cope and drag flasks.

4. Show the necessity of centering or placing the pattern in the flask so that it will not come too close to the sides or ends. Explain the application of draft on patterns.

5. Demonstrate the use of the riddle, how it should be held with the four fingers of each hand underneath, and then slapped from side to side against the palms of the hands. Have individual students do this before the class.

6-7. Show how the flask is rammed and struck off, and have one or two students do it.

8. Explain that venting is necessary because of gases forming in the mold when the molten metal is poured in, and the necessity of having numerous vents or outlets. Demonstrate the use of the vent wire.

9. Demonstrate how the bottom board is rubbed into place and clamps put on over both follow board and bottom board. Show also how the flask is rolled over with the minimum of exertion.

10-11. Show how to remove the follow board, the use of parting sand, which is burnt-out sand, and the placing of the cope flask in position.

12. Explain why the sprue pin is set a short distance from the pattern, and the metal is not poured directly into the mold.

13-14-15. Demonstrate the ramming of the cope, drawing of the sprue pin, the use of the thumb in pressing down the sand around the hole left by the pin, and the lifting of the cope. Explain the reasons for dampening the sand along the edge of the pattern before drawing.

16. Show how and where to drive the lifting pin if rapping plates are not on the pattern, and explain the need of care in drawing from the sand.

17. Demonstrate the cutting of the gate, and explain its purpose and dimensions.

18. Show how plumbago or graphite is shaken on the faces of the mold, and explain that this blackening aids in securing clean, smooth castings.

19. Show how the mold is closed up and clamped and made ready for pouring.

TO DO A MECHANICAL OR ARTISTIC PIECE OF WORK THOROLY IS MUCH MORE THAN THE MATERIAL OPERATION. IT IS A MORAL ACHIEVEMENT.

Prseident Emeritus Charles W. Elliot.

RUSH SEATING.[1]

L. Day Perry

RUSH and similar materials have very limited use in the wood shops and workrooms of manual training schools. Rush seating, employing either genuine rush or substitutes, may be done to good advantage and with excellent results in such shops and rooms. No equipment is needed to maintain such work. The addition of a woven seat to a chair or stool constructed in the shops will necessarily employ a new, interesting medium in conjunction with woodwork, and materially increase the pupils' knowledge of materials and possible combinations. And, as with caning, the resultant interest in the work at hand more than justifies its introduction in manual training shops. Rush seating employs a very simple weave. Different materials employed in weaving naturally require different degrees of skill, and the difficulties encountered are those resulting from handling materials and not because of the complexity of weave. One may very readily undertake the rushing of ordinary seat frames after a study of printed directions and illustrations. It should be understood at the outset that, in discussing rush seating, materials other than genuine rush are included in the term.

HISTORICAL.

In the British Museum at London is a seat of curious shape, of Egyptian manufacture, which, it is estimated, was made previous to 4000 B. C. A small amount of rush still clings to the seat frame. The relative date of the construction and weaving of the chair seat would indicate that rush seating is by no means a modern art, altho at present rush is extensively employed in furniture.

The use of rush in England dates no earlier than 1720. Several types of chairs were made there between this date and 1870. In France rush was used extensively in the seating of furniture of Normandy and Brittany about 1750. Flanders produced rush-seated chairs at an early date, and many were constructed in this country in early colonial days, prior to 1776, as well as later. Such chairs were undoubtedly patterned after those brought over from Holland, France, and England to the early settlements in America, and after the Revolutionary War.

[1] The photographs, half-tones of which appear in this article, and appeared in the previous articles, were taken by T. Sinclair Moore, of the Joliet Department of Manual Training.

In early times rush always served a function in the seats of chairs and stools, and was very seldom, if at all, used on the better class of furniture. The use of cane or rush on furniture for decorative purposes only is distinctly a modern idea. Utility, rather than beauty, prompted the introduction of seats of rush.



FIG. 1. LADDER-BACK CHAIR WITH RUSH SEAT.

Modern furniture of excellent design and workmanship employs rush seats. These are either woven over a separate frame and inserted or are an integral part of the chair, being woven over the seat rails of the chair itself. Fig. 1 shows a modern adaptation of a ladder back chair with rush seat. The rush in this chair is woven over the rails of the chair. Fig. 2 shows a flat view of the seat.

RUSH.

Rush is the name applied to many fistular, stem-like plants of similar or like growth. Properly, rush belongs to the sedge family. The different species vary greatly in appearance; some are low and slender; some are tall and leafless; and some are broad leaved. They are found in wet places thruout the northern hemisphere, along banks of sluggish streams, and in lowlands and marshes. The great bulrush is common and familiar, while the chair-maker's rush is not as well known. The plants most commonly known as rush are called by the names of flag and cat-tail. In fact, flag and cat-tail are very generally used for rush seating. The technical names of the different species of rush are not pertinent or desirable here.

OTHER MATERIALS.

Materials other than rush may be used for rush seating, as has been stated. Rush is rather hard to manage in that no appreciable length

may be handled because of the shortness of the leaf, and twisting is necessary. Fiber, or similar materials, is to be recommended for shop use in that a great length is procurable, and the twist is made. It is made of machine-twisted paper, and comes in long, indefinite lengths.

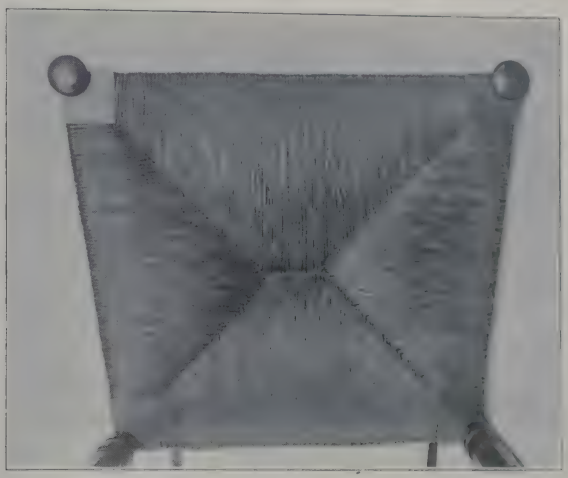


FIG. 2. SEAT OF LADDER-BACK CHAIR.

It is tough, strong, and serviceable, and procurable in spools of about one hundred pounds each. Fig. 3 shows such a spool together with a bundle of rush. It is manufactured with or without a flexible wire center and costs from ten to fifteen cents a pound. It may be had in several colors and sizes.

Raffia is well known thru its general use in basketry and allied work. In rush seating it has no conspicuous place, altho it may be utilized to great advantage. Raffia is the leaf of a certain palm, cut in narrow widths and varying in length from two to five feet. It is bought in hanks, by the pound. The hanks should not be untied but as strands are needed they should be pulled out from the head end of the hank. If improperly handled raffia will become badly tangled.

Corn husks, taken from close to the ear, may be used, particularly for seating chairs of toy furniture. The husks near the ear are not as coarse and brittle as those outside. The shortness of the husks precludes their general use, altho they produce an excellent seat when properly woven.

The materials mentioned by no means exhaust the list of available

mediums for rush seating, but will give considerable and sufficient variety for shopwork. As the weaver comes to appreciate the limits and advantages of the various mediums for certain grade work, he may utilize local plants and grasses suitable for such work.



FIG. 3. SPOOL OF FIBER AND BUNDLE OF RUSH.

PREPARATION OF MATERIALS.

Rush—and in the term are included cat-tail and flag—is common to almost any locality in our northern states. It should be gathered when full grown and still green. It is ready for cutting when the tips of the leaves begin to turn brown. This is usually about the middle of August. The leaves are tied in loose bundles for convenience in handling, and dried in the shade, preferably a darkened room. They should remain here until thoroly dry. Before using, soak the rush about ten hours in water. Less time is required if warm water is used. When it is soft and pliable it is ready for weaving.

Before weaving, the butt ends of the leaves are cut off about a foot from the base. These are too coarse and stiff to properly weave. One leaf may be used or two leaves may be twisted together to make a strand. Three leaves make a coarse strand, two a medium, and one a fine strand. A long, tight twist is necessary to produce an even, smooth strand. The twisting is always done in one direction. One leaf is recommended for beginners in rush seating, for adding to one is much simpler than adding to several. The under side of the seat need not be as smooth and as well woven as the top. In fact, twisting need not be done underneath at all unless the individual worker so desires.

Raffia is easy to manipulate because of its pliability, even when dry. Several lengths will need to be twisted together to produce a strand of sufficient size. It requires little soaking to make it ready for use. Raffia produces an even, smooth surface of pleasing appearance, and is very desirable in a seat.

Fiber may be woven as it comes from the spool. However, it is better to dampen it by plunging a quantity in water and removing at once. When it dries after weaving, a slight shrinkage results, thereby making a tauter seat than could be woven with dry strands. Inasmuch as the fiber is paper, it cannot be soaked in water.

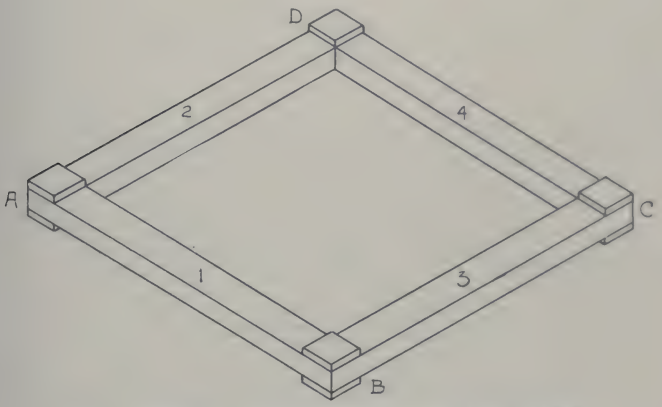


FIG. 4. ISOMETRIC DRAWING OF FRAME FOR RUSH SEATING.

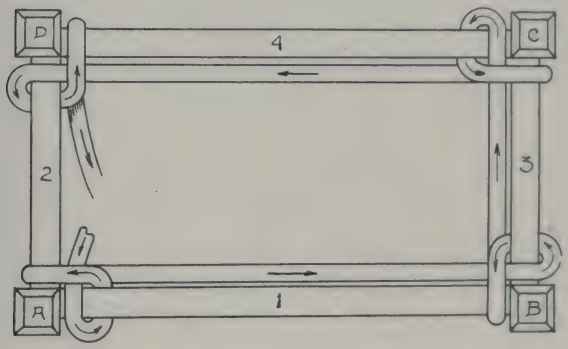


FIG. 5. METHOD OF WEAVING FIRST STRAND.

THE WEAVING PROCESS.

With the frame ready, and rush in proper condition, the weaving may be started. Fig. 4 shows an isometric drawing on which corners are lettered, and the rails numbered in order. Fig. 5 shows another drawing on which the corners and rails are similarly lettered and num-

bered, showing graphically the method of weaving the first strand. The arrows indicate the direction of weave. The operation is practically complete once around the frame. Reference may be made to either drawing in the following detailed directions for weaving.

Start arbitrarily at any corner—in this case A. A strand of rush tightly twisted is laid over rail 1 next to the cap with its short end turned down. The beginner may find it advantageous to tack the end in place. Draw the strand over the edge and bottom of rail 1 and up at the inner corner, then over the top and edge of rail 2. This binds the loose end in place if it has not been previously tacked. Pull the strand directly across the frame opening to the top of rail 3 at corner B. Draw it over the edge of the same rail and under, then up at the inner corner and



FIG. 6. STICK USED IN STUFFING SEATS.

over the top and edge of rail 1. Pull directly across the frame opening to the top of rail 4 at corner C. The operations at corners C and D are identical to those at A and B, and these repeat themselves indefinitely at each corner, or until the seat is completed. This applies to square seats only. The end of the last strand may be secured with a tack under the proper rail, or twisted around a strand underneath the seat.

The strand is twisted as the weaving progresses. This may be done with the palm of the hand and thigh, in much the same manner as a shoemaker waxes his thread. If one leaf of rush is used to make the strand, new leaves are added by tying the two ends in a square knot at a corner, or wherever such joining will not show on the finished seat. When more than one piece of rush is used for a strand they should be of uneven lengths initially. One leaf or piece at a time is then added. The upper or top end of the leaf is used to begin the seating and each leaf added is attached at its top end.

Some expert rush seaters do not tie knots in making strands, but add leaves by twisting the end of the preceding leaf about the added one, "like the color on a barber pole," as one old rush weaver remarked. Adding by twisting only, is difficult, and is an accomplishment of experts and not for amateurs.

Care must be exercised to keep the strands from overlapping improperly at the corners. The strands should fit snugly where they go

over the rails. To assure this, tap them sharply with a mallet used over a block of soft wood. This may be done at frequent intervals or when several strands have been woven over each rail. Uniform tension on the strand is desirable and this should be tight.

As the work progresses the interior between the upper and lower rows of strands is stuffed. This is done with the same material as that used in the weaving. The butt ends of rush are used to stuff the seat of rush; raffia is used to stuff a raffia seat; craft paper to stuff a fiber seat; and so on. The packing should be done in a thoro manner for it

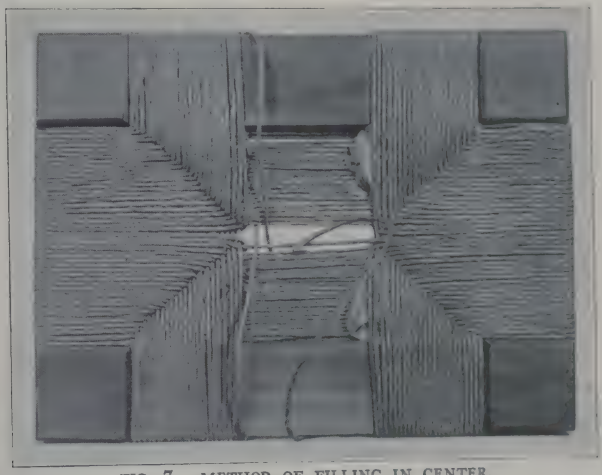


FIG. 7. METHOD OF FILLING IN CENTER.

builds up the seat and prevents its breaking down at the inner edges of the rails, and sagging with continued use. A slightly curved hardwood stick about 12″ long may be used to advantage to do this work. Fig. 6 shows a sketch of such a stick. It is ¾″ in diameter at one end and tapered to ½″ by ⅛″ at the other. Considerable force needs to be exerted in packing, and caution used to avoid breaking strands.

RECTANGULAR SEATS.

As stated, in weaving a square seat the initial process is repeated at all corners until all openings are filled. In rectangular seats the spaces on the short rails will fill before those on the long rails. Weaving around corners is then manifestly impossible. Fig. 7 shows a partly

woven seat with the short rails filled, and the process of filling up the remaining area under way. The method is this: Go over and under a long rail, across half the frame opening and up thru, then across the remaining distance, and over and under the other long rail. Repeat

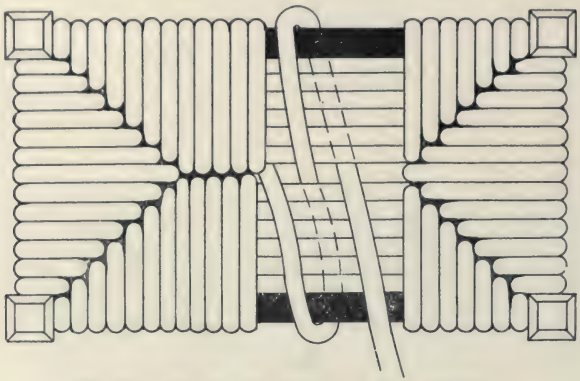


FIG. 8. METHOD OF FILLING IN THE CENTER.

until the seat is completed. Fig. 8 is a sketch of a partly woven seat, illustrating the method of filling in the center just described. It supplements the photograph and makes the method clearer.

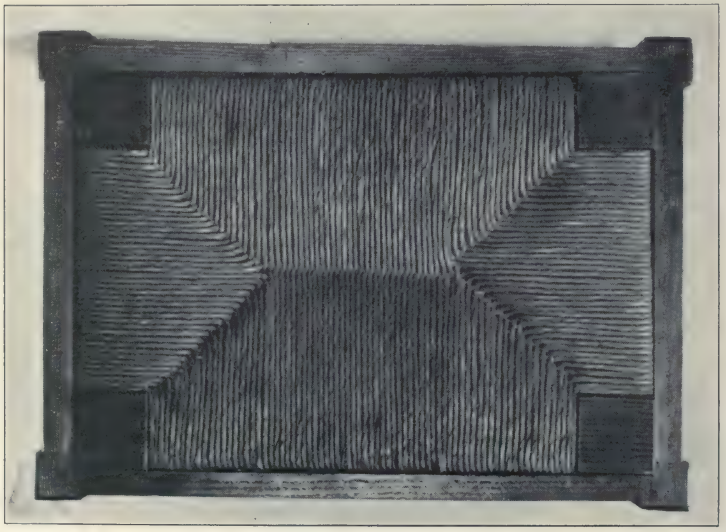


FIG. 9. COMPLETED TOP OF FIBER.

It should be noted that the strands in crossing at the center must be compressed one-half of their diameter. They will need to be tapped sharply with a small mallet or hammer to produce proper crowding. Fig. 9 shows a stool seat of fiber, woven by an eighth grade boy. Fig. 10 shows the complete stool. The seat is woven over a separate frame and inserted. Fig. 11 is a child's chair of oak, with seat of fiber woven over rails of the chair.



FIG. 10. COMPLETED RUSH SEATED STOOL.



FIG. 11. A CHILD'S CHAIR WITH FIBER SEAT.

IRREGULAR SEATS.

The usual or standard shape of chair seat is like the one illustrated in the drawing, Fig. 12. The front rail is longer than the back, and the side rails equal in length. Seats of this shape are rather difficult to weave because special treatment is necessary to fill up portions of certain rails. With reference made to the drawing, the method employed in locating lines for rushing, and for rushing such a seat is this:

With the handle of a square laid against rail 4 and its corner against the cap at corner A, scribe a pencil line across rail 2. Similarly, mark the same rail using the square against rail 4 at corner D. Stated in other words, these lines may be obtained by determining the difference in length between the front and back rails. Then lay off one-half this difference, from each corner, on the front rail. This distance is indicated by the brackets in the drawing.

Now tie with a string as many strands of rush as will be needed to fill in this difference between front and back rails. Fasten them underneath corner A. Then use one strand, twisted, and weave around corners B and C and fasten under corner D. The weaving is identical to that described in square seats. Weave in each strand in the bundle at the same corners and tie under corner D, or until the spaces marked off on the front rail are filled. It may be necessary to add to or to remove strands from the bundle if calculations as to number of strands

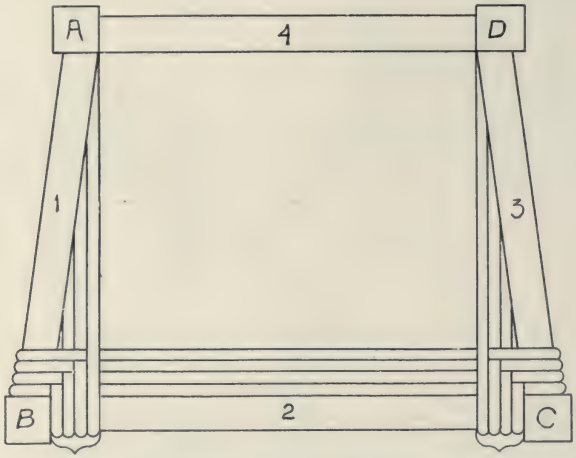


FIG. 12. METHOD OF STARTING SEAT OF IRREGULAR SHAPE.

necessary were inaccurate. Tie all loose ends together at corner D, fasten securely and cut off all extra lengths.

Start now as in beginning a weave on a square seat, weaving around all corners in the regular way. The first strand around will effectively bind the bundles of ends at corners A and D.

SUGGESTIONS.

In using paper fiber or similar materials which come in long lengths, a strand twenty or twenty-five feet in length may be used at one time in weaving. For convenience in handling it should be formed in a loop and held together with a strong rubber band. The strand may be unlooped a little at a time as the weaving progresses. In using rush, raffia, and like materials, the strand is made as the weaver works, so at no

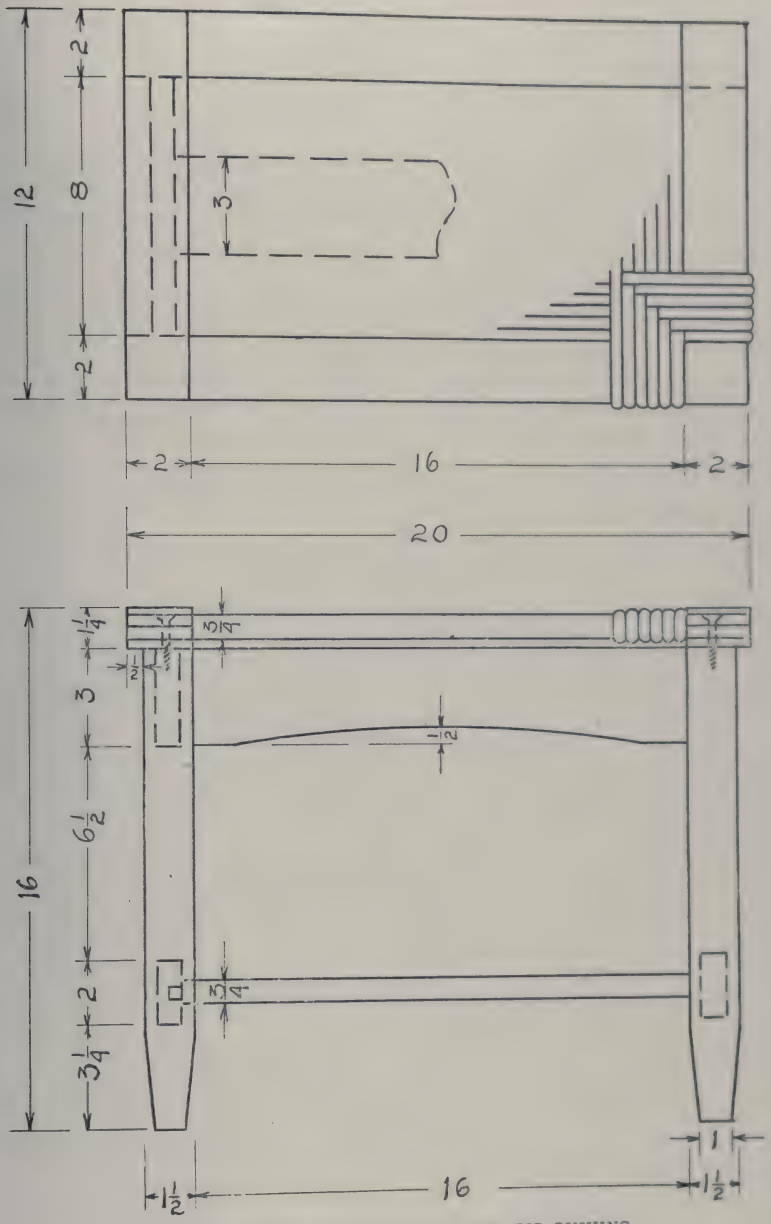


FIG. 13. WORKING DRAWING OF STOOL FOR RUSHING.

time is there a strand exceeding five feet or so in length to handle. No special expedient is therefore needed.

Raffia, fiber, etc., may be purchased from supply houses or direct of the manufacturers. Rush may be gathered in almost any community by any energetic instructor and pupils, and properly cured. In fact, gathering the raw material and preparing it for use is desirable in many ways, and is to be encouraged. Undoubtedly rush may be obtained from manufacturers of rush chairs. It costs fifteen cents per pound, dry.

Fig. 13 is a working drawing of a stool or seat. The constructed problem would appear very similar to the one shown in Fig. 10. The seat frame is fastened to the base with concealed screws. The upper caps are temporarily fastened until the weaving is completed, when they are removed and the frame fastened to the base as indicated. The caps are then replaced permanently. Generally speaking, for initial work in rush seating, it is advisable to weave over a separate frame. Such a frame is conveniently handled, and better work will result.

FINISH.

Some agent to preserve a rush seat is necessary. Rush should be coated with equal parts of oil and turpentine, followed by two coats of tough, elastic varnish. The necessary time should elapse between coats. Some manufacturers do not use oil, and apply varnish only. Raffia and husk seats should be treated as rush. Fiber is varnished only. A brittle varnish is to be avoided for it will chip off with little use, and a seat is subject to hard wear.

GRAMMAR SCHOOL WOODWORKING MADE WORTHWHILE.[1]

LEON LOYAL WINSLOW

IF we were to ask the average eighth grade boy of today what he had made in the school shop during his public school career, he would reply by giving us a list of the projects which he had constructed. His list would undoubtedly contain taborets, blotter pads, footstools, *et cetera*; and we would not be far from the truth certainly in supposing that somewhere, not far from the top of his list, would appear the word book-rack. And yet a grade making book-racks today is placed under suspicion by some of our modern educational leaders. The present-day instructor of the book-rack boy is at once placed in the "book-rack-coat-hanger" class, is dubbed sloyd advocate, and is regarded as unindustrial.

Has it ever occurred to us that these critics might be wrong in their conclusions; that a book-rack might, under certain conditions, be just as much of an industrial problem as a cabinet, an electric motor, or a cement sidewalk? It is simply another case of work and workman. Will we sacrifice the man for the sake of his work, or will we consider the education of the man as our foremost aim, and use as a means to that end whatever may promise the most effective returns, regardless of whether that means may or may not have received the censure of a few ultra-progressive educational leaders? Industrial life does not deal entirely with big things nor does it always deal with new things. Education demands psychological method as well as practical content, and even as common-place and as ordinary a thing as a book-rack may be so vitalized and motivated as to make it a most educative and inspiring proposition. Yet we would in no way detract from the acknowledged value of big things; we would only emphasize the fact that there is a place for each and that each is most valuable under the peculiar conditions which demand it.

The making of a book-rack may not be regarded by some as worthy the efforts of an energetic grammar school boy. And yet there is a place for just this exercise, a place where other means might fail. Here it will justify itself upon the psychological side, and it will stand the industrial test as a piece of work demanding the thoughtful application of hand tool processes.

[1] With designs made by summer school students at Bradley Institute, working under the guidance of Robert C. Craig.

There are book-racks which are worthless when considered from any point of view whatever, and there are others which are good in design as well as rich in manipulative possibilities. To allow a boy to carry to completion a problem poor in its constructive elements or of bad design is a crime against society. That this has been done over and over again, and especially in the case of the book-rack, does not justify us in making the general statement that book-racks are not worthy of consideration in the public school shop.

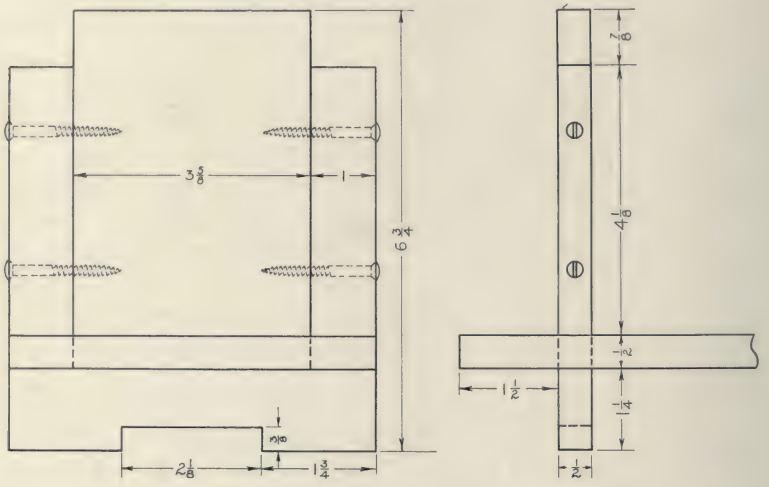


FIG. 1.

There are few problems so well adapted to the teaching of elementary structural design as book-racks. In this project we do not have to study out a simple method of approach. The simplest method suggests itself at once. The problem is one which deals with the division of space in its most fundamental form. The upright end parts of the project are considered as simple rectangles which are to be so broken up as to make a pleasing and harmonious whole. These rectangles may be modified by the pupil at will. He has before him the simple object of treating as best he can a small area. He is able at this stage of his development to handle a small area well. And it is only by working with such problems that he will be capable later of dealing most effectively with large pieces of furniture where the consideration of large spaces is necessary.

Then why not begin by designing large pieces upon a reduced scale? Because the application of scale measurements will not be understood if

a proper emphasis is to be placed at this time upon design. It is true that designing to scale should follow such work, but it is most essential that this should come after designing to full scale has been carried on for some time. As a beginning problem in real industrial design and execution there is nothing quite as good as full scale work. Power to

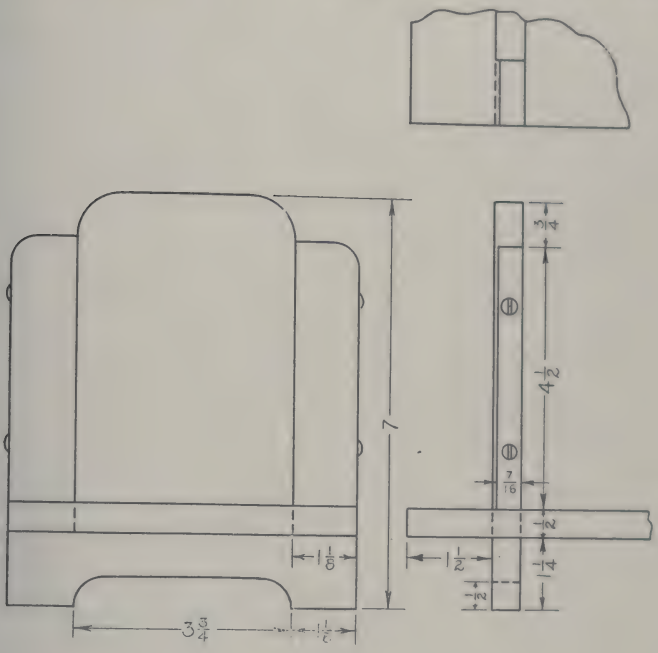


FIG. 2.

undertake big things will easily grow out of such a beginning. We do not wish to convey the impression that the book-rack is the most evident means by which such instruction can be carried on; we do not recommend it as the most effective. It is but suggested as a typical problem which is representative of a multitude of its kind, more or less difficult, which can be treated in like manner.

The drawings shown herewith are suggestive of a somewhat new application of mortise-and-tenon construction. In Figs. 1, 2 and 3 the book-racks consist of seven pieces of material each; that is, two end parts which are composed of three pieces each screwed together, and a shelf board. The other drawing, Fig. 4, shows a model containing three parts; that is, a shelf and two end pieces. In this latter case no fastenings what-

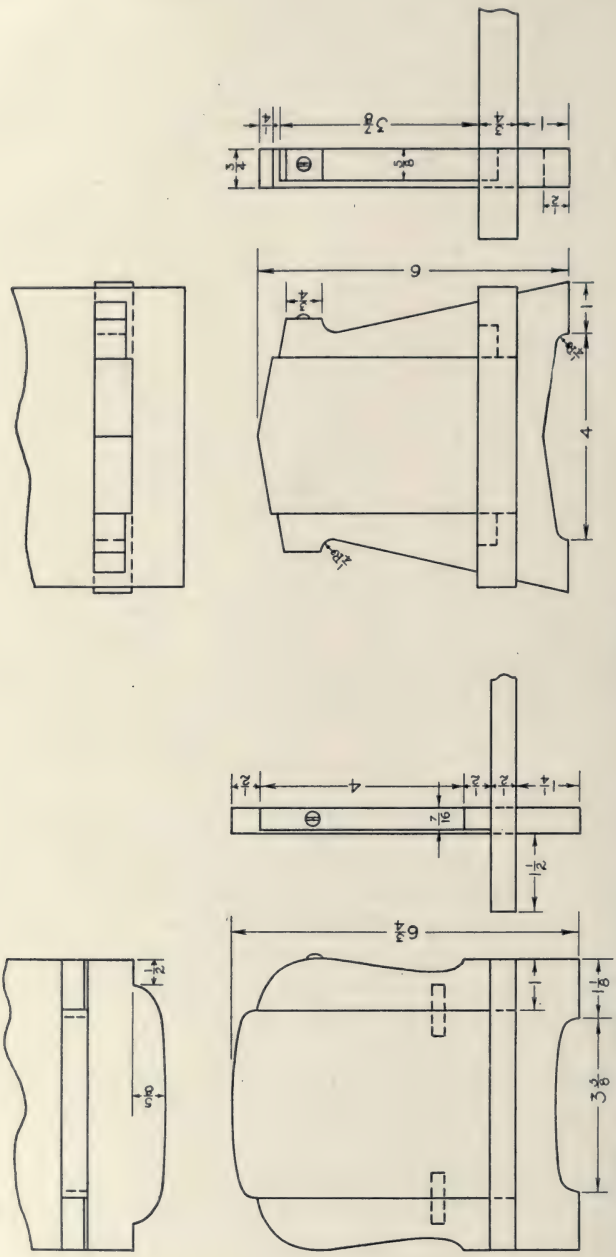


FIG. 3.

ever are used. A shelf containing mortises is placed over the three tenons provided for in the design of the end pieces. The rack then holds itself together. Book-racks of this type can be easily taken apart and put together, and for this reason they are valuable to one who travels. Such book-racks look well upon most flat-top desks or tables. They can be kept clean by an occasional taking apart and dusting.

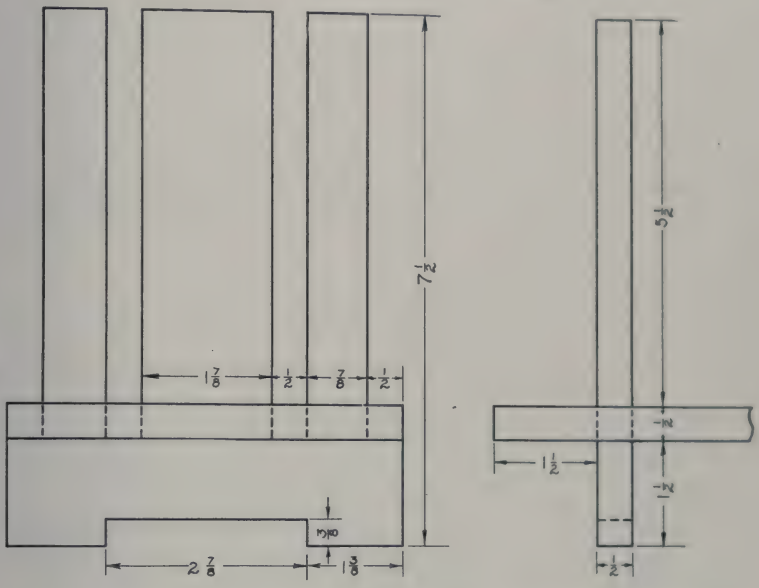


FIG. 4.

The boy who undertakes to make a book-rack of this type starts out by designing the end parts. The only specifications necessary at the outset are: (1) that these end parts shall be of a size and shape sufficient to accommodate books of usual size; (2) that the mortise-and-tenon joint shall be employed, the tenons forming the end parts above the shelf.

As the design progresses it may be modified continually until finally it is made practical on both the artistic and the technical sides. The finished article must not only stand firmly, but it must appear to do so. This is, in part, what structural design really means—that design makes things strong in the sense that screws, nails, and glue make them strong; that without strength of design an article, tho it might hold a ton by actual weight, would yet be frail and weak.

The work of actual construction begins as soon as a satisfactory design has been prepared. It is for the sake of clearness that the following fifteen steps are given. None of the tool processes are discussed in detail, it being taken for granted that these processes will in each case be understood by the reader. The steps are given in the form of directions based upon the natural division of tool processes into units.

The steps of construction are as follows:

1. Choose a piece of ½″ stock long enough and wide enough to make the shelf board and ends, allowing plenty of stock for finishing.

2. Mark the working face; square and mark the working edge; gage width of piece from working edge, and plane to gage line.

3. Measure off on working edge the lengths of the three parts, allowing a small space between the parts for sawing, and place points. Square knife lines entirely around stock at these points and designate working face and working edge on each of the sections that these marks may be retained when the stock has been sawed into sections.

4. Saw the stock into three parts as marked.

5. Place the two parts from which the ends are to be made upon the bench one part upon the other, with the working face of each up, their working edges together. Being careful that all nails are driven into wood which will later be cut away, nail together the two pieces.

6. Considering these parts thus fastened together as one piece of stock, square the ends, finishing accurately to knife lines.

7. Measure along the working edge of this compound piece of stock, the required distance from one end to the shoulder of the tenon to be layed out, and place a point.[1] At this point square a knife line entirely around the stock.

8. Square the shelf board, working accurately to the desired measurements.

9. Measure from each end of this shelf board along the working edge the distance at which it is desired to place the mortise or mortises, and place a point. By superposition of the end parts measure in, on working edge of shelf of stock, which often is variable, will thus give the exact width of mortise necessary. At these points square knife lines entirely around the stock.

10. Make all measurements from the working edge, and set the gage but once for each common lateral measurement required in the laying out of the mortises, lay off on both end parts and shelf board the lines corresponding. (This will necessitate marking off on both sides of the stock, at each separate setting of the gage, the tenons of the end pieces and the corresponding mortises at both ends of the shelf board.)

11. The end pieces are now worked into shape. Two of the nails holding these parts together may be left until most of the work of truing to the lines has been accomplished. All the edges may be worked almost to the lines upon both

[1] For the sake of strength, this distance should under no circumstances be less than 1½″. Construction will determine in each case what the dimension should be.

sides, just enough of the material being left for the final fitting of the joints. When the final cut is made the two end parts will be separated and can be worked individually.

12. The mortises in the shelf board are now cut out and finished to knife and gage lines.

13. The fitting of the end parts to their corresponding mortises is now undertaken. One mortise or series of mortises is marked I, and its tenon or series of tenons is marked I; the corresponding parts at the other end of the shelf board are marked II and II, respectively. Care must be taken while fitting the parts to keep the working edges of the end pieces upon the same side as the working edge of the shelf board. If this is done an accurate fit will easily be attained.[2]

14. Not until all tool processes have been completed and the work finally assembled, should the work of finishing begin. The book-rack is now taken apart, the various parts sanded separately with a piece of 0 sandpaper which is placed over a small block of wood. The parts of the tenons which are to fit tightly when the book-rack is assembled and the mortises, of course, will not be sanded.

15. Each part is now finished separately as desired. A stain finish with wax over it will be found attractive. Or the wood may be filled, stained, shellacked, and rubbed with pumice, if a hard gloss is desired.



FIG. 5.

Fig. 5 shows a view of the book-rack planned in Fig. 4. This particular model was made by a student in the School of Education, University of Pittsburgh.

The above description of processes involved in the making of a book-rack will undoubtedly cause some readers to question the advisability of

[2] In the case of the book-rack with blocks screwed to each side of the tenon above the shelf board, these blocks should be made at this stage in the process. A working edge is planed and a piece of stock prepared long and wide enough to provide for all four blocks.

undertaking such work in the grammar grades. They will argue that too many processes are involved, and that such a small article as a book-rack should demand fewer operations. They may further question the feasibility of devoting so much time to so small a piece of work. These are all legitimate points to bring up. A book-rack is a small and commonplace project. In the particular case in question, however, the project has not in any way been advanced to the position of ultimate goal or end point. It is merely suggested as a means to an end, the final aim being an educational element entirely.

It is one thing for a boy to look ahead to a finished article as his only goal; it is quite another matter for him to center himself in his job. In the latter case he will not only enjoy his work, and profit to the fullest thereby, but he will ultimately be rewarded by a finished product which will far surpass anything that a finished product as a goal could ever inspire.

There is little doubt but that industrial arts should have as one of its major aims the education of the man who takes pride in his job. The writer believes that he has in past years accomplished more with seventh and eighth grade boys by systematic work of the kind discussed in this paper than he ever could have accomplished by leaving the method of procedure largely to his pupils' originality. Originality in the choice of a project is a most helpful asset to pupil as well as instructor, but the method of procedure can *not* be left to the originality of grammar school boys. Just as words are the tools of literature, and figures the tools of mathematics, likewise, in all the manipulative work of industry, there are tools other than those made from iron and steel. These are the A B C's and the multiplication tables of all handwork, and they are fundamental; without them all material tools are of no avail. Not until the use of these tools has been mastered will the pupil be able to do in the school shop a kind of work which is capable of being judged by the standards of industrial practice.

The average boy of grammar school age today is unwilling to interest himself seriously in anything which does not demand his best efforts. He has passed beyond the play-as-play period and his desire now is to play scientifically, which, after all, is the best definition we are able to find for work. It is up to us as teachers to preserve to our boys the significance of the meaning of such a definition of work by giving them what their entire makeup demands; that is, work which they enjoy because they can see that it is work worth while.

What we need today in industry, and in professional life as well, are men with scientifically trained minds—men who can do and who can appreciate a good piece of work; men to whom their work is a joy, in reality a sort of play; men of power and of originality, whose original ideas, however, are capable of fruition because there is something behind them besides originality alone. It rests with us as teachers of industrial arts to do all that lies within our power to make the training of such men a reality.



THIS IS THE DRAWING-ROOM IN THE NEW STATE NORMAL COLLEGE, BOWLING GREEN, OHIO. THE ROOM FACES THE EAST, AND AN ABUNDANCE OF PROPER LIGHT IS OBTAINED FROM FIVE PAIRS OF DOUBLE WINDOWS. THIS ROOM FURNISHES A STANDARD OF EXCELLENCE IN SCHOOLROOM DECORATION WHICH CAN HARDLY FAIL TO INSPIRE ALL WHO WORK IN IT WITH IDEALS WHICH WILL HELP THEM TO BEAUTIFY THEIR OWN SCHOOLROOMS WHEN THEY BECOME TEACHERS.

THE EDUCATIONAL SURVEY OF CLEVELAND—III.

W. E. Roberts.

SEVEN sections of the report of the Cleveland Survey were briefly reviewed in the February and March numbers of this Magazine. Four additional sections have appeared in the intervening month.

MEASURING THE WORK OF THE PUBLIC SCHOOLS.

CHARLES HUBBARD JUDD.

This section of the report is manifestly considered of great importance by the Survey committee and is given more than twice as much space as any of the preceding sections.

In June, 1914, 10,000 children, an average of one in seven, failed of promotion in the Cleveland schools. Many causes for failure can be given, each of which presents a problem that is of interest to the community, and which it is consequently the business of the schools to solve. These failures, or non-promotions, are ingeniously analyzed and illustrated by diagrams and tables; and tabulated, first by grades, second by subjects of instruction and finally for individual schools. The results, with few exceptions and in individual cases, do not differ widely from what would be found in other school systems. The figures, therefore, are significant to all interested in public education. Results leading to inevitable conclusions are graphically presented. For example, increasing failure as the grades advance, compared with a tabulation of the estimates of teachers that non-promotions are largely due to mental incapacity, suggests the advisability of revising the demands upon pupils in the higher grades. A study of failures in subjects reveals interesting facts. Failures in reading decrease with considerable uniformity from the first to the eighth grade, indicating satisfactory results or possible undue emphasis upon this subject. Failures in arithmetic, on the other hand, increase rapidly from the first to the fifth grade and then decrease to the eighth grade, following closely the general curve of non-promotion, suggesting undue importance attached to the subject as well as the advisability of revision. Similar problems appear in the records of other subjects. The facts revealed are startling as well as illuminating. The study of individual schools shows wide differences, suggesting the neces-

sity for readjustments to meet local conditions. Records of individual schools for a period of years, individual schools compared with the whole system and variations in grades each reveal significant facts. Revised courses and scientific supervision are shown to be necessities.

The larger part of the section is devoted to the methods and observations of the Survey, and to tests in writing, spelling, arithmetic and reading, with generalizations upon the findings. The results are graphically presented in 86 diagrams and tables.

In criticising the work of the schools, the Survey calls attention to the emphasis upon formal training to the exclusion of enrichment of the curriculum; to the wide difference in the quality of teaching, much of which is poor, especially in high schools; to insufficient and ineffective supervision, the weakest point in the Cleveland work; to lack of men teachers; to rigid and traditional work in the upper grades; and to the lack of stimulating professional contact and work among teachers.

Results of a study of the kindergarten lead to definite recommendations for the relation of this work to the primary grades. The relations between the elementary grades and high schools, including a discussion of the junior high school, are carefully considered and urgent recommendations are made.

The situation in the high schools is considered at length. The evils resulting from the policy of specialized high schools lead to the conclusion that the cosmopolitan high school is desirable, altho it would appear to one studying the report, that the evils referred to are local, and might be eliminated in a well organized high school system of the Cleveland type. The advantage of the splendid equipments of the technical high schools, which would be impossible in a number of cosmopolitan high schools, is not noted in the report.

The forms, letters, instructions and materials for the tests and investigations are given complete in a generous appendix.

This section of the report should be of great value as suggesting the methods of testing the efficiency of a school system.

SCHOOLS AND CLASSES FOR EXCEPTIONAL CHILDREN.

DAVID MITCHELL.

Cleveland has been a pioneer city in providing for exceptional children who do not fit into the regular work of the schools. In 1876 a Boys' School was established for truants and incorrigibles, and in years that

have followed, schools and classes for the deaf, for backward children, for defectives, epileptics, steamer classes, crippled children, industrial schools, and classes for the blind have been added, providing at present for 2500 children, cared for by 140 teachers.

These schools have developed in an effort to provide the best instruction for various types of children in meeting the demands of universal compulsory education. The criticism of the Survey is that there has been no definite guiding principle of organization. This principle is to be found in what we may expect to be the later life of the child. Exceptional children may be divided into two classes: the socially competent, who, tho physically defective, may be educated to compete in the world's affairs, and the socially incompetent, the mentally defective, who must always be more or less dependent. The first should be taught in special classes in regular schools; the last in special schools.

Under this classification, the report discusses somewhat in detail the various types of work for exceptional children in Cleveland, commending the present policies, or recommending changes which are deemed to be of advantage to such children.

A chapter is devoted to methods of determining feeble-mindedness in children, to a discussion of various tests of intelligence, particularly the Binet-Simon tests, and to recommendations relative to the organization of a Division of Examinations. Another chapter sets forth a comprehensive scheme for handling the problem of the feeble-minded in Cleveland.

The section is not without decided error in facts and classification due to misconception of aims and results, and some of its recommendations are at least open to question and discussion.

DEPARTMENT STORE OCCUPATIONS.

IRIS PROUTY O'LEARY.

This section is written in the interests of young people who may seek employment, and for those who are concerned with the right development of what is defined as human raw material.

Three types of stores are considered: the department store, the neighborhood store and the five and ten cent store. The study includes not only salesmanship, but also necessary coordinate and more or less related activities. The picture is composite rather than specific. In the department stores from 40 to 60 per cent of employes take in money, while the remainder make the selling of goods possible, and among this last group is a great variety of occupations demanding a wide range of tastes

and capabilities. The greatest number of opportunities for employment and promotion is in the selling force. In general, employment is continuous, the rush season being supplied by extras. The function of the neighborhood store, even tho large, is local. The "productive" force is larger, running as high as 80 to 90 per cent. Opportunity for promotion is greater but average of salaries slightly less. In five and ten cent stores wages are lower, conditions less favorable, and opportunities for promotion of women and demand for expert salesmanship negligible.

Under working conditions and health are discussed what the employe should contribute to his health, working conditions, length of working days, lunches and lunch rooms. A chapter on wages and employment deals with beginning wages, the factors controlling wages and the wages of women and men compared with those of other industries, and is graphically illustrated by diagrams. An analysis of jobs gives somewhat in detail the requirements, remuneration and prospects of the various jobs in the department store, as information necessary to a scheme of vocational training. That vocational training is needed, is attested by the fact that most large stores in Cleveland provide instruction for their workers, some of which is manifestly inadequate. Elimination of waste, increasing cost of operation, stability of skilled labor and increase of capacity are factors demonstrating the need of vocational training. Two types of vocational training are possible, preparation and extension training. The Survey believes that, under present conditions, the last is the more essential and therefore confines its consideration and recommendations to this type of training. The possibilities for organization and the character of instruction are suggested and numerous examples are given of analysis of technical knowledge needed in different departments.

A closing chapter on looking for work is written for young people leaving school and looking to the department store for employment. It treats of the law concerning work papers and gives suggestions for those seeking employment.

OVERCROWDED SCHOOLS AND THE PLATOON PLAN.

SHATTUCK O. HARTWELL.

This section considers the question of a larger use of the school plant as a measure of economy in the rapidly growing city, where school building accomodations can not keep pace with increase in school population. This larger use of the school plant is best accomplished, in the judgment

of the Survey, by using one factor of the Gary plan for utilizing school buildings. The desired end is attained thru adjustments by which all special as well as regular rooms are constantly used, under an arrangement designated by the Survey as "The Platoon Plan."

This is described as an arrangement whereby all of the children of a building are divided into two equal groups of classes, one of which occupies regular rooms in regular studies the first half of each morning, while the other is in special work in auditorium, gymnasium, play and other special rooms. At the middle of the morning session the groups change places, and in the afternoon the same procedure is followed. By thus utilizing constantly all special rooms, and by doubling classes in some special subjects, it is possible to greatly increase the capacity of a school building. The essential points are given as:

Two groups of pupils per teacher for regular work.

Special teachers for special subjects.

Rearrangement of daily time-schedule.

Rearrangement of rooms and equipment.

The plan is illustrated by the amplification of the organization of a typical school. Problems of organization are illustrated by specific time-schedules. Under administrative problems, necessary readjustments in equipments, records of attendance, etc., are detailed.

A chapter is devoted to comparative costs and another to Cleveland conditions in relation to the Platoon Plan.

ORGANIZATION OF PROJECTS IN MANUAL AND INDUSTRIAL ARTS.

LEONARD RIGHTER

MASS instruction grew out of the necessity of handling a large number of individuals in a group at a given time under one instructor. It is based on the assumption that the individuals of the group are all alike and have the same needs, capacities, and aspirations. But only a few people have the same needs and capacities, therefore the problem arises of how to take care of the needs growing out of individual differences.

The writer believes that the methods used in science teaching may contribute points that will help to solve these problems for shopwork. For years each pupil in physics and chemistry has been working idividually in the laboratory, and such individual work has been made possible by the laboratory direction sheets.

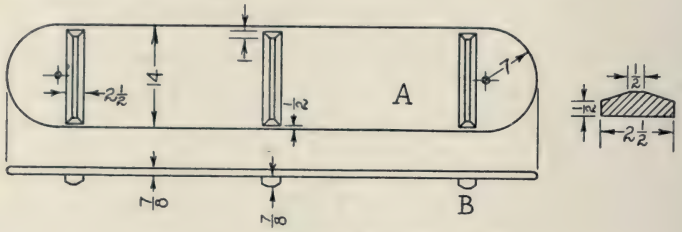
A modified form of these sheets may be worked out for the various projects taken up in shopwork. These direction sheets for any one project will, by means of questions, directions, and suggestions, endeavor to lead a pupil forward along right lines of procedure. Such directions are not intended to take an instructor's place but by their use he can be relieved of much detail in the matter of directing each individual's own line of thot. As heretofore, the instructor will demonstrate activities such as planing, sawing, chiselling, etc., in which all are interested, and will continue his talks on materials. From all such things, as well as their experiences in working out their projects, the pupils will make up their notes. The direction sheet will have its place in helping to direct the work of the pupil at his bench and it corresponds to the use made of similar sheets in the chemical laboratory.

It is believed that these sheets offer the following advantages:

1. Each pupil can work on the project most suited to his own capacities and interests.
2. He can work forward as fast as his own abilities permit.
3. The sheets serve as directories of material and information.
4. Having written directions before him the pupil has no excuse that he did not remember instructions.
5. The instructor has more time to go about giving individual help.
6. Such sheets make possible a better correlation between the shop and the classroom.

Teachers can not be blamed for not correlating with the shop when, in general, they know so little about shopwork. Shops are often removed some distance from the classrooms and unless the teachers visit the shops every day they can not keep in touch with the work. By placing these direction sheets in their hands they are able to know just what is going on and what each pupil has under way.

A necessary part of this plan is some form of duplicating apparatus such as a hectograph or mimeograph. If the work can be laid out far enough ahead the school print-shop may prepare the sheets.



IRONING BOARD.

The following is a sample of such a direction sheet prepared for a simple form of an ironing board:

THE IRONING BOARD.

Use:—These ironing boards will be used in the ironing room of the laundry.
Find out who will use them and for what purpose.
How must these boards be prepared before they can be used?
What will support them? Why not have regular legs like a table?

Attack:—The sketch shows the nature of the article wanted.
Make up a mechanical drawing of the board on the standard-sized drawing paper. What would you consider an appropriate scale to use? The drawing of the circular end may be a new problem.
What is a radius? If this end is to be part of a true circle, how would you find the center in order that the straight lines will exactly join the curved lines? Make up a bill of materials and the proper requisition order for the same. Which will be more serviceable, screws or nails, to hold the strengthening cleats? Why?

Construction:—Work out a plan of your own, indicating the manner in which you propose to work. Get the instructor's approval before cutting any material.
Find out the advantage of wide or narrow pieces for A with reference to warping. What are the disadvantages? When should strips B be cut? Why?

What are the essential things about making a tight joint for gluing? In cutting the end circles?

What plan have you for holding the cleats fast while they are being fastened?

Occupation:—Find out where work of this kind is most often done. Compare your method of work with the machine method as to time, ease, cost of production, quality of work.

What is the nature of the work done by woodworkers in mills where such articles are made? What are the hours of work? When are the slack seasons? What are the wages? What dangerous machines are there? How guarded? What conditions injurious to health are there?

Correlation:—

1. Find out if the making of such articles as ironing boards has ever been organized as an individual business. Why is it often a side line? How did people get such things in colonial or pioneer days? Why do they get them differently now?

2. Where did the wood for this board come from? How did it reach this city? Over what lines? Through what cities and states? What is the nature of the country where the forests grow? What is the character of the tree—form, branching, bark, leaf? Why is it called a "soft" wood? Can it be cut to show a grain? Why is it less expensive than some other wood? Will these trees grow on any kind of soil.

3. How were the trees cut? Taken to the mill? How were the logs made into the lumber? What were the machines used? How was the lumber changed from green to seasoned lumber? How was the lumber smoothed? Why has a foot of lumber a different value in the ironing board than when it stood in the tree? In how many different ways was value added to the tree value?

4. Read for information in Carpenter's geographical readers; also "How the World Is Housed," and *Forestry* (magazine).

The information gathered and the method of making the board may be put into a composition.

Note the spelling of such words as whitewood, ironing, cleats, chamfer, gluing, etc.

Make a careful drawing of the ironing board with dimensions and a bill of material to be used.

What would be the length of the drawing on your paper if the scale used were $\frac{1}{8}''=1''$? $\frac{1}{4}''=1''$? $\frac{1}{16}''=1''$?

How many board feet of lumber are required for 1 ironing board? For 25?

What is the cost at $60 per M?

What is the cost of the screws at 5c per doz.

If six boards can be made in a day by one man whose wages are $3.00 per day, what is the cost per board?

What is the total cost of 1 board? Of 25?

Make out a receipted bill for 25 boards.

What per cent of all the lumber required is needed for cleats? What per cent of the cost is due to labor? To hardware? To lumber?

What must the selling price be to make a profit of 30 per cent? 40 per cent? 55 per cent?

EDITORIAL COMMENT

PREPAREDNESS.

THE entire country is talking preparedness. "Preparedness for war" is the cry of the many, and "inaction of any sort" is from the mouths of the few. But is there not a type of preparedness of a higher and more effective order than that about which we are now hearing so much? Will military training for the high school boys of a state be helpful in time of war? Will a stronger organization of state militia be more serviceable? Will a larger standing army and a larger navy serve the needs? These are questions which every one is discussing? But Germany and France have had more than these. They have a united people. They have well governed cities. They have vocational training. They have a civic consciousness which is expressed in a national consciousness. The cities of Germany are conducted on a business basis. The transportation lines are at the service of the Government in time of need. We do not hear of scandalous grafting of public officials. We know that the mayors are trained for their jobs. We know that workmen are insured against accident and disease and that the whole country is organized so that the people may serve the government and the government may serve the people.

Germany has prepared for war through preparing for peace, and France is doing remarkably well in this war because of a new national life which took hold of her people after the last great war. England, unfortunately, is not be compared with the two countries mentioned. She shows lack of industrial organization, of a national consciousness, in fact, a lack of preparedness for peace, and consequently a lack of preparedness for war.

Turn to our own country. We must prepare for war, not necessarily for war against nations, but for the war against ignorance, vice, disease, poverty, graft, inefficiency and mismanagement. We are not a united people either in language or in intentions. Those who can not speak our language certainly can not unite on intentions. City officials that will graft on school supplies or hospital supplies in times of peace will not hesitate to graft on war supplies. A school system which would think only of a little military drill for a few boys in the high school instead of physical and civic training for all the pupils of both sexes for

all the grades shows that it has a small conception of the real sinews of war for peace or for defense.

Vocational training can play a tremendous part in the preparedness program. On good authority it is stated that 2,800,000 men are needed at home for every million men in the field. There are shells to be made, powder to be manufactured and transportation to be provided, mechanicians for army aeroplanes and automobiles, and a thousand and one items of activity at home while the poor brothers are fighting in the field. Every dollar laid out for vocational training in the public school is a dollar laid out in preparedness for war and, thank fortune, for preparedness for peace. Every cent spent for physical and civic training of the youth of our land is of direct value to it as individuals, as members of society or, if worse comes to worst, as privates in a regiment.

—DEAN.

WHO SHOULD SUPERVISE THE BOOKWORK?

IF one may judge by the amount of time and space devoted to its discussion, the paramount educational problem today is the determination of the principles which shall govern the organization of courses of study for the early adolescent child, let us say the pupil between twelve and sixteen years of age. To the solution of this problem several experiments in school organization have been addressed, notable among them being the 6-3-3, the 6-4-2 and the 6-6 plans; the general industrial schools; and the prevocational schools and classes.

In all this there is to be found a wonderful opportunity for supervisors and teachers of manual training if they will but recognize it. While the manual training instructor may have an important part to play in any of these schemes of reorganization, the one offering him the greatest opportunity for genuine service is the prevocational school.

The central fact in all the current discussion of this important problem is the recognition of individual differences in children, differences in physical and mental characteristics and capacities, and differences in financial and social opportunities. The frank recognition of these differences leads inevitably to the admission that differentiation of subject-matter, differentiation of teaching method, and differentiation of school organization should be made earlier in the course than is done in the traditional school system. With a few notable exceptions, educators are coming to agree that this opportunity should be afforded at the beginning of the seventh grade, the beginning of the junior high school period.

The prevocational schools have long accepted these principles and have succeeded in reorganizing both the manual work and the so-called academic instruction for boys and girls between thirteen and sixteen years of age. These schools are planned specifically to appeal to a special group of pupils who are strongly inclined toward manual or technical work and whose years in school seem to be sharply limited. In such schools it is customary to divide the time about equally between the shopwork and the book subjects, and to relate the two as closely as may be.

Much popular and professional interest has been shown in the organization of the shop courses in prevocational schools, so much so in fact that it has given the impression that the shopwork is the most important part of the prevocational program. It is only recently that attention has been called to the superior importance of the book work and to the necessity for readjusting it on radically new lines. It is our opinion that the opportunity to take a leading part in the reorganization of this so-called academic work is overlooked too often by the manual training supervisor. So long have we been accustomed to the idea that manual training is only an accessory of the real education of the child, and that the manual training teacher is merely assisting, in a relatively subordinate capacity, in providing one of the minor elements of his training, that it does not occur to us that the manual arts supervisor may take a *leading* part in this new development of school activities.

The history of prevocational education, however, tells a different story. Some of the most successful prevocational schools in the country have been organized by manual training supervisors, and are under their immediate direction. Not only is the supervisor responsible for the shop courses but he determines the nature and extent of the instruction in the book subjects.

A little reflection will show that there is no good reason why the manual training teacher should not be as intelligent in revising the academic courses as the academic teachers themselves, for the pupils are not far advanced and the work must be relatively simple and quite general in character.

On the other hand there are many reasons why the manual training teacher is especially well qualified to superintend this reconstruction of the traditional courses. In the first place he is relatively free from the traditions which now determine, in large measure, what subject-matter shall be presented to seventh and eighth grade pupils. He is able,

therefore, to eliminate the non-essentials with less reluctance than one who has long been of the opinion that these things are necessary to the educational salvation of all pupils.

The manual training teacher is more inclined to be sympathetic with the prevocational boy since he is probably "concrete minded" himself, especially if he be an exceptionally good manual training teacher. He therefore is more likely to encourage the boy than to criticise, and thus help him to achieve success.

Again, his work should bring him into closer relations with the practical problems of the work-a-day world into which the boy may soon enter. He is better able, therefore, to determine "what knowledge is of most worth" to the prevocational pupil.

In fact the industrial and prevocational schools have brought to light several excellent administrators among the manual training fraternity. It is not possible, in these comments, to be personal, but the close student of vocational work in the public schools will find that much of the admirable organization is directly traceable to the ability and discrimination of manual training supervisors who have been placed in charge of these special educational institutions. Herein lies an opportunity for service, and likewise an opportunity for gaining merited recognition, of which manual training experts will do well to take special notice.

—LEAVITT.

CHICAGO'S VOCATION BUREAU.

ONE of the most welcome pieces of school news that has come to our attention during the past month is the action of the Chicago Board of Education in taking over the Vocation Bureau of which Miss Anne Davis is the head. This bureau has been maintained by the Federation of Women's Clubs until it has demonstrated its need as a public institution and its efficiency under its present management. At present Miss Davis has three assistants in the work, but the plan of the Board of Education involves an enlargement of the force to eight in the near future.

One of the significant facts concerning this Bureau is that employers are finding that it renders a real service to them in sifting and classifying the boys and girls who apply for positions. They seem to be willing to pay the minimum wage established by the Bureau, even if it is a little higher than they have usually paid to beginners, provided they can get

the right kind of workers. By studying the needs of the employers and the qualifications of the boys and girls, and in the belief that "All children are good for something" a valuable public service is being rendered by this Bureau. The children who usually have no thought in mind except to find "a job that will bring in a larger supply of immediate dollars" are led to think ahead in selecting a position. The mother, too, who says, "Mary might just as well wear her clothes out working as going to school," is led to see that the future possibilities in a position are usually worth more than present cash. Moreover, the Bureau does not believe that its responsibility is ended when the child is placed. Its follow-up work is done with the same thoroness as the placement work.

It is evident that Chicago is trying to get rid of such incidents as the one told by the writer of a pamphlet entitled "Cooperation between Employers and Schools," issued by the school print shop at Rochester, N. Y. It is this:

> Recently, the writer stood in the office of one of the largest clothing manufactories in the world, when a little girl came in to apply for work. She looked to be about twelve years old but the work permit in her hand attested to the fact that she was over fourteen and had completed the work of the sixth grade. She entered the office timidly, approached the desk, and in a voice that was scarcely audible, inquired, "Have you got a job for me," and her face showed plainly that she expected a negative reply. The manufacturer talked with the girl kindly, took her name and address, promised to send for her when a vacancy arose, and sent her away smiling. Then he turned and said, "That was a typical case and scores of them come into my office every week. Some day, I hope that the employers and schools will get together so that it will not be necessary for young people who want work to walk the streets looking for it."

THE EASTERN AND WESTERN ASSOCIATIONS OF MANUAL ARTS TEACHERS.

THERE is evidence that both the Eastern Arts Association and the Western Drawing and Manual Training Association are to have especially successful meetings this spring. The former meets in the Municipal Auditorium at Springfield, Mass., April 20th, 21st and 22nd; the latter at Grand Rapids, Mich., May 3rd, 4th, 5th and 6th. Millard B. King, president of the Eastern Association, and E. E. MacNary, chairman of the local committee, have been at work with twenty-five committees since January to make the convention worth while both professionally and socially. There will be a banquet, organ recital, numer-

ous exhibits, personally conducted tours to industrial plants in addition to the general and round table meetings.

Similar activity on the part of S. J. Vaughn, president of the Western Association, and L. R. Abbott, chairman of the local committee has been evident for some time. Already they have announced as speakers, Governor Ferris of Michigan, Lorado Taft, Dr. James Parton Haney, and Dr. Charles A. Prosser, and they have secured the Klingman Furniture Exhibition Building containing 35,000 square feet of floor space which they expect to have filled with educational exhibits. The annual banquet will be held on the evening of the opening day.

There is every reason why these two organizations should receive the enthusiastic support of all the teachers of the manual arts. Both of the associations are now on a broad professional foundation. The Western Association was the first to get the larger vision, but now the Eastern Association is developing rapidly in enthusiasm and effectiveness. Both have demonstrated their value to the profession and to every member who attends their meetings. Any teacher or supervisor of drawing or art work of any kind, or household science and art for girls, or of manual training and vocational subjects for boys will show his progressive spirit and prove himself to be wide awake professionally by attending one of these meetings. Some teachers feel that they are well repaid for attending both.

President Wilson's Toast

at the Closing of the San Francisco Exposition.

THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION:

WHICH IN ITS CONCEPTION AND SUCCESSFUL ACCOMPLISHMENT GAVE STRIKING EVIDENCE OF THE PRACTICAL GENIUS AND ARTISTIC TASTE OF AMERICA;

WHICH IN ITS INTERESTING AND UNUSUAL EXHIBITS AFFORDED IMPRESSIVE ILLUSTRATION OF THE DEVELOPMENT OF THE ARTS OF PEACE; AND

WHICH IN ITS MOTIVE AND OBJECT WAS ELOQUENT OF THE NEW SPIRIT WHICH IS TO UNITE EAST AND WEST AND MAKE ALL THE WORLD PARTNERS IN THE COMMON ENTERPRISES OF PROGRESS AND HUMANITY.

OF CURRENT INTEREST

THE ILLINOIS MANUAL ARTS ASSOCIATION MEETING AT JOLIET.

THANKS to the larger vision, the organizing ability and the persistent, effective efforts of Albert G. Bauersfeld, president, and of L. Day Perry, chairman of the local committee, the 1916 meeting of the Illinois Manual Arts Association held in Joliet, February 18th and 19th may be counted as the largest and certainly one of the very best that this organization has ever held. And this is saying a good deal, because the Association has long since formed the habit of having good meetings. In the first place, everything in Joliet was open to us, from the penitentiary to the homes and hearts of the people. The local exhibit of school work was a good one, and it seemed that every teacher of the manual arts in the city was seeking every opportunity to be of service to visitors. In the second place, the bringing into the meeting of a large group of household arts teachers, most of whom came from Chicago, added the element necessary to round out the membership of the organization. In the third place, the program was one of special merit. Superintendent Shoop of Chicago, was at his best, and gave an inspiring address on "Democratization of the Arts", at the banquet on Friday evening. At the same meeting Miss Bertha Case, supervisor of domestic science in the public schools of Peoria, spoke effectively on "Home Planning." Other addresses during the convention were given by Miss J. H. Snow of Chicago Teachers College, Professor Albert F. Siepert of Bradley Institute, Mrs. H. M. Sabin of the Lucy Flower High School, William Backrack, supervisor of commercial work in Chicago, Miss Edith Brown of the Lane Technical High School, C. W. Sylvester of Springfield, L. G. Mitten of Wilmette and others. C. E. Howell of Decatur presented a partial report of the manual training survey of the state undertaken by a committee of the Association. This part of the report was just long enough to cause every one to want to hear the rest of it. Plans are on foot to complete the formulation of the results, and to publish them in the next report of the Association. One of the speakers from outside the state was Professor W. H. Varnum of the University of Wisconsin, but formerly of Illinois, who gave a practical discussion of design as applied to manual training projects, especially to furniture. The lecture was illustrated with a fine collection of lantern slides. Probably all would agree that the climax of the

program was reached when Dr. Charles A. Prosser, director of the Dunwoody Institute, Minneapolis, gave a remarkably clear, logical, forceful, and thoroly interesting address on apprenticeship and working agreements.

From beginning to end the meeting was carried on in fine spirit. The only suggestion of serious disagreement was at the time of voting on the place of meeting next year. Centralia had worked very hard to get the next meeting. Ottawa wanted it. Peoria was finally accepted as a compromise, and will be the meeting place in 1917. The officers elected were L. Day Perry of Joliet, president; Mrs. Helen M. Sabin of Chicago, vice-president; and B. G. Leuchtenberger of Centralia, secretary. Albert F. Siepert of Bradley Institute was elected editor. The Course of Study Committee was asked to provide several outlines of the newer manual arts subjects, and a revision of some of the outlines already published, in time for them to go in the next yearbook of the Association.

THE ATTITUDE OF ORGANIZED LABOR.

Whenever the subject of vocational education at public expense is under discussion the attitude of organized labor is a factor to be considered. In the recent Vocation Bureau hearing before the School Management Committee of the Chicago Board of Education Victor A. Olander, Secretary-treasurer of the Illinois State Federation of Labor, spoke as labor's representative, and was reported by some of the newspapers in such a way as to leave the impression that organized labor in Chicago was opposed to vocational education. In order to verify the report we wrote to Mr. Olander. His reply was that the newspaper reports of his speech were incorrect, and that he still adhered to the statements in the report of the vocational education committee of the Illinois State Federation of Labor made in 1914. As a further indication of the attitude of organized labor he referred to the action of the American Federation of Labor at its meeting held last November in San Francisco. The five paragraphs approved at that time were as follows:

1. That in approving industrial education, equal attention should be given to the general educational studies and requirements of the school children. Your committee believes the latter of greater importance to the future welfare of the workers than the former instructions.

2. That industrial education should include the teaching of the sciences underlying the various industries and industrial pursuits being taught, their historic, economic, and social bearings.

3. That all courses in industrial education shall be administered by the same board of education or trustees administering the general education; that no federal legislation on this subject shall receive the approval of the American Federation of Labor which does not require a unit system of control. The bill should also conform to the several recommendations herein submitted.

4. That the Department of Labor, at Washington, be requested and urged to cooperate with the Executive Council in conducting a thoro investigation into existing vocational or industrial schools and systems of industrial education in vogue, in order to determine wherein such teaching has benefited or harmed the workers; that this survey also include a careful investigation into existing shop practices and trade conditions in order to determine what industries, if any, are lacking of trained and experienced workers; such investigation to determine also the number of workers who are trained and experienced and who are out of employment, due to their inability to secure employment because there are more trained workers in that particular trade or vocation than the industries can employ. It is likewise desirable that a comprehensive investigation be made to determine the extent of monotonous and automatic work in vogue.

5. That Congress be urged to make a proper and sufficient appropriation to the Labor Department in order to permit of this investigation being made in the most complete manner possible, as well as to enable the Labor Department to enforce all such rules, regulations and laws enacted, and intended for the benefit of the workers of this nation.

ADVANTAGES OF JUNIOR HIGH SCHOOL.

In a pamphlet on courses of study for the high schools of Michigan, Fred L. Keeler, superintendent of public instruction. suggests an organization and courses of study for, at least, the smaller high schools of that state. He approves what is known as the six-six plan. Under this plan the pupil remains in the grade school only until he has completed his sixth school year. He then enters a junior high school. Superintendent Keeler's pamphlet is devoted to an exposition of the advantages of the junior high school plan. In a leaflet proposing a boys technical high school in Albany, New York, a somewhat similar plan is convincingly worked out; and Harry P. Study, superintendent of schools at Neodesha, Kansas, has issued a pamphlet, in which can be found a report of a junior high school in actual and successful operation. A summary of the advantages of the junior high school, as given in these pamphlets, may be stated as follows:

1. The child changes mentally and physically about the time he finishes the sixth grade.

2. By this time in his school experience the pupil needs to be allowed to choose subjects for study that appeal to him. This should be

done under the direction of parents and teachers. His personality will thus be encouraged to assert and develop itself.

3. The pupil, during the critical period of the seventh and eighth grades, needs the advantages to be had from the teaching of the stronger instructors usually found in the high school. One of the chief advantages of the junior high school is that it necessitates the strongest of teachers.

4. The break now existing between grades and the high school needs to be done away with.

5. The pupil needs to be given departmental teaching in the seventh and eighth grades. As a result of this, more expert instruction will be given in the several branches. The pupil, also, will be spared the humiliation of having to repeat a whole grade because he has failed in one subject.

6. The child needs more time than the present system allows for his manual training, domestic science courses, and so on, and this is easily provided under the departmental organization, especially when a choice of groups of studies is offered.

7. The pupil needs to be placed early in high school environment, started into work of his choice, and thus kept in school.

8. The stronger pupil needs opportunity to advance at his own pace. Under the present plan he can rarely do his four years high school work in three. In the six-year high school, however, he may plan to finish in five years without lowering the quality of his work or jeopardizing his health.

THE SCHOOL PAPER PRINTED IN THE SCHOOL.

The school paper is not a new venture, but a school paper for which the students prepare the material, do the editing, typesetting, presswork, binding and distributing, is a development of the past few years. The value of printing as a school subject is so many-sided that one hesitates to emphasize its usefulness in any one direction. As a socializing influence it is par excellent. A school print shop very quickly forces upon students the value and need of cooperation in all lines of activity, and "team work" comes to have a vital place in their thinking. It stimulates loyalty to the school, and keeps the teachers and students in touch with all the school activities. It also establishes a sense of values; the work of the compositor and pressman calls for certain qualifications that are just as necessary to the success of the paper as are those of the editor, reporter,

business manager, and contributors. Thus a wholesome respect for the work of each department lends new dignity to work of all kinds. Another valuable feature of the school print shop lies in the fact that when the school paper is printed by the students in their own shop, a justifiable pride in their own handiwork is kindled. It is truly an expression of the student body and carries with it the "cosmic urge" to higher achievement.

The correlation of printing with other school subjects is more varied than appears at first thought. The student in English who writes for his school paper soon learns that cold type publishes to the world with unrelenting accuracy his every weakness in spelling, punctuation, and sentence construction. This impresses him with the importance of his English work as nothing else could. Printing also calls for the expression of one's artistic sense. To the student of design it offers a new field of application of the following laws and principles upon the basis of which beauty appears: (1) appropriateness to occasion and use; (2) consistency in the character of parts; (3) proper display; (4) pleasing space relations; (5) balance of attractions; (6) harmony of colors; (7) excellence of technique. The mathematics of the print shop is also a very important part of the commercially successful shop. To know from what size of paper a sheet of given dimension will cut with the least waste, how to figure the required amount of stock for a given job and its total cost, are questions that are involved in every job of printing, whether small or great; and errors on these points may indeed be very costly.

An appreciation of the possibilities of printing leads us to note with much interest the many school papers that come to us. Among those that are beautiful examples of the printers' art are *The Apprenticeship Bulletin,* published by the North End Union School of Printing, Boston, Mass., and *The Apprentice Printer,* published by the Committee on Apprentices of the United Typothetae and Franklin Clubs of America. It is only fair to expect these schools to excel, since they are distinctly schools of printing and should be looked to as sources of the finest examples of this American craft. *The Artisan,* published by the students of the Dunwoody Institute, Minneapolis, Minn., is perhaps the youngest child in the family of school papers. In looking it over one is impressed with the idea that back of it there must be a well-organized group of students. Every department of the school is represented in an interesting way, and one gleans much information about the school in general thru

this paper. Two school papers are published in Pittsburgh, Pa., namely, *The Industrial,* published by the printing department of the Irwin Avenue Industrial School, and *The North Star,* published by the boys of the North Industrial School. *The Worker,* the product of the Boys' Industrial Public School, Newark, N. J., *Vocational Progress,* published by the class in printing in the Vocational School of Bayonne, N. J., *The Pioneer,* the work of the students in the South High School, Grand Rapids, Mich., *Lane Tech News,* printed and published by the students of the Lane Technical Evening School, Chicago, Ill., and the *Press Record,* the organ of the prevocational school at Stockton, California, are all characterized by a fine school spirit and fill a place in the activities of the students.

PROMOTING INDUSTRIAL ART INSTRUCTION IN NEW YORK CITY.

The rapid development of art instruction in the high schools of New York City should serve as an example to other cities. During the year 1914-15 there were 6,400 pupils receiving instruction in the art department. In the work of giving instruction to this large number of students Dr. James P. Haney has a corps of 138 teachers, and expects to add more next year.

One of the important elements in this increase in attendance is the definite policy of Dr. Haney to make art of more use in the lives of the students and the community generally. To this end a survey of the art industries of New York City has been conducted by the teachers of the Washington Irving High School. Information has been gathered on the kinds of work done, the pay, the training required, and the steps necessary to adapt the work of the school to the needs of the industries. Looking in the same general direction is Dr. Haney's recommendation that a scholarship in industrial art be established in each high school. It has been suggested, also, that a docent, or visiting teacher, be employed to promote cooperation with the museums. Another plan is to establish little loan museums of art in the different high schools. This, if the scheme is carried through, will see the Brooklyn Institute Museum and the Metropolitan Museum place a few pictures and one or two exhibition cases in each of the high schools of their respective boroughs. "With a few such cases," says Dr. Haney, "and a few pictures, each high school might thus be put in a position to offer, with the aid of the museums, a succession of helpful and stimulating exhibitions to its pupils."

Most emphatic of all Dr. Haney's recommendations is that in which he renews his plea for a day industrial art school which might be united with a normal department for the training of art teachers. Urging this, he says, "This recommendation has been repeatedly made but gains force at the present time from the lamentable results of the great war now being waged upon the continent of Europe. Continental schools have hitherto furnished the larger number of our skilled industrial art workers. These schools are now, for the most part, closed. Many have lost forever their skilled teachers. Meanwhile, an increased necessity and an increased opportunity await the development of trained art workers in this country. New York City, as the largest manufacturing center in the country, particularly needs a day industrial art school to train artist-artisans and to train art teachers. The hour does not merely favor the creation of such a school, it demands it. A constructive public policy should meet this demand."

MANUAL TRAINING INCREASES THE EFFICIENCY OF THE RURAL SCHOOL.

The Marinette Eagle-Star for Feb. 17, 1916, contained an interesting special section devoted to the country schools of Marinette County, Wisconsin. In one of the articles of this section the claim is made that the introduction of manual training into the country schools has helped solve the problem of poor attendance. In this connection the following statement is made:

> Attendance at rural schools is always another matter which school officials, boards, and teachers have to contend with. Nothing has shown better results in enhancing school attendance than the special activities such as hot noon-day lunches, agricultural work, social center work, manual training and domestic science. In one state graded school of the county, which lost its state aid last year because of the attendance falling under a certain percentage of the number of children of school age in the district, an entirely different state of affairs was brought about this year through some intelligent activity by the teacher. She initiated some of the new social and industrial work and hot noon-day lunches. It had been contemplated to take action under the state law to compel the parents to send their children of school age to school, but the teacher writes that due to the new work and new interest in education in this district, the attendance is so good that legal steps will not be necessary. It is possible that other schools where low attendance is a problem, can go far toward solving the difficulty by similar means.

Another article describes how the girls of Marinette County sew and make jelly at school for their mothers, and how the school buildings are kept in repair by the boys.

When a ten or twelve year old girl attending a rural school in a partly developed community learns how to make part or all of her clothes at school or under the guidance of the school, the mother sits up and takes notice. That is education in terms that hit very close to the mother's every day life, and it looks better to the mother than any "highbrow larnin'."

When eventually sister Grace, aged eighteen, who finished the rural school course two years before, is drawn into the sewing class at the school, attending days when instruction is given, and takes a fresh load of work off mother's shoulders by her abilities as a seamstress, there is still further understanding of the new work in the country school, and further interest by mother in all the affairs of the school.

When the children at school, under direction of the teacher, do sewing for the mothers in the district as part of their instruction and training, the link between mother and school is still closer.

When, as was actually done last fall, the girl pupils make jelly for their mothers at the school, the last vestige of the distance between mother and the school has been bridged. What is true of this domestic science work and the mothers is equally true of the agricultural and manual training work and the fathers.

The manual training and domestic science departments have been fully equipped this year. In the manual training department, the four-student benches were installed making room for the entire class of the sixth, seventh and eighth grade boys. A drawing table has been built by the boys, also a rack placed on the wall with a background of dark green burlap, upon which all the general tools are hung, displaying them to great advantage. Most of the repairing about the building has been done by this class. Many of the boys worked overtime and also on Saturdays that they might complete their projects in time for Christmas.

In still other articles, descriptions are given of reading circles for pupils and teachers, which continually help develop free ideas, and of actual farm work taught in the schools, stock judging on farms in the district, poultry raising, seed germination, and similar things.

Especially interesting are the various accounts of improved school buildings constructed and maintained by the people of Marinette County. Better school organization is made possible by better buildings. The new high school of Wausaukee is proof of this statement. In this school, the work of the eight grades is successfully combined with a high school course, consisting largely of hand work of various kinds, and work directly connected with the life of the agricultural community, whose children it trains. Of this school the statement is made: Wausaukee's new high school sets a high water mark in rural schools. In this spacious and beautiful structure the sons and daughters of the townspeople and farmers may become finished stenographers or bookkeepers,

or they may complete splendidly practical courses of work in agriculture domestic science and manual training, as well as attain a general education.

Such, we may hope, will be the country school of the future in the United States.

HOME PROJECTS IN HIGH SCHOOL COURSES IN AGRICULTURE.

Many teachers of agriculture in high schools have felt that a wider use should be made of the home farm, both to give the pupil practical work with plants or animals, and to correlate more closely the activities of the class with the actual work of the home and farm. While many believe that there should be home projects in agriculture as a feature of every high school course in agriculture, the need for work of this sort at home is particularly important where the high school is not fortunate enough to possess a school farm.

To assist teachers in developing home projects in agriculture, the States Relations Service of the Department of Agriculture has recently issued Professional Paper No. 346, "Home Projects in Secondary Courses in Agriculture." This bulletin discusses in detail the development of the home project idea and its use in various States where it has proved successful. This is followed by a discussion of the essentials of a home project in which are included directions for keeping records, blanks and forms, and typical outlines for projects on potatoes, pigs, alfalfa, orchards, poultry and the farm home. These home projects are classified as production, demonstration, improvement, and management projects, the last dealing with the business side of the farm.

DETROIT MANUAL TRAINING CLUB REPORT.

Each year the Detroit Manual Training Club sends its president to other cities for the purpose of observing the manual training and industrial work in the schools. These observations are summarized and embodied in his annual report to the Club. The report of President H. N. Eddy, for the year 1915-16, has just been published. It is a very interesting review of the different types of handwork done in Pittsburgh, Rochester, and Boston.

It was found that cardboard work, basketry, and thin woodwork were usually taught in the fourth, fifth, and sixth grades as a prerequisite to the bench woodwork of the seventh and eighth grades in grammar schools. Considerable diversity was found in the type of

handwork offered and the indication was that an organized attempt is being made to have the handwork fit the special needs of the community in which the school is located. In Boston it was found that concrete work, printing, woodwork, and, in the poorer districts, cobbling were being offered. Printing is being strongly emphasized this year; many rebuilt printing presses are being installed and many new teachers who are capable of handling printing are now being employed.

In Pittsburgh, the Boy Scout Movement has been felt and in some instances has caused slight modifications of courses. An aeroplane contest conducted by a large department store, a kite-flying contest, and bird house contest conducted by the schools, and now the making of a great number of fly-traps for use next spring has been responsible for many changes in the grammar grade work.

The reorganization of the courses in the Mechanic Arts High School in Boston has been looked upon very favorably. During the first three years each boy has a 45-minute period of shopwork or drawing each day. Bench woodwork, cabinet-making, turning, pattern-making, forging, machine shop and architectural and machine drafting are the mechanic arts subjects offered. In the fourth year a student may specialize in any one subject from two to four hours per day. The first three years might therefore be classified as prevocational in character and the fourth is distinctly vocational.

The cooperative course in the Hyde Park high school, in Boston, is briefly reviewed as follows: "The manufacturer cooperates with the school and allows two students to alternate—one working in the factory or office one week while the other student is in school, or vice versa." The Hyde Park school is especially fortunate in having three large factories near it. The fact that the general-manager of one of these is also a member of the board of advisers of this department tends to promote unity of action. It is pointed out that whenever manufacturers do show an interest in this type of school work it is desirable to foster this interest.

It was found that the average age for admission to prevocational schools was between thirteen and fourteen years, or equivalent to being ready for entrance into the sixth grade. The time given to shopwork ranged from two to three hours daily. It was found that a considerable amount of commercial work for the boards of education was being done in the prevocational schools. At first, sub-normals and incorrigibles were admitted. This was found very unsatisfactory. The former have been entirely eliminated, and the numbers of the latter have been greatly reduced.

In the North Industrial School of Pittsburgh a very strong and interesting course in sheet metalwork with a correlated course in drawing of developments was found. Thoro courses in electricity and printing were offered which developed both the practical and theoretical sides of the work. The academic subjects offered included English, mathematics, geography, and elementary science.

The Rochester Shop School, in Rochester, has received considerable publicity. Boys are in this school 6¾ hours daily, one-third of the time being spent in the shop; one-third in drawing, mathematics, and shop and industrial science; and one-third in English, civics, and other academic subjects. The most emphasis is laid on machine shop, electrical construction, woodworking, and printing. In the electrical department a rather unusual situation exists. One instructor is a college graduate, and the other is from the trade. In the theoretical work of this department the International Correspondence School course is followed.

The Vocational Education Department of Rochester has agreements with a large number of firms in that city to employ only such students as the board of education recommend. Among these firms are the well known Eastman Kodak Company and the Stein-Block Tailoring Company.

Such a report as was made by President Eddy, together with much illustrative material gathered during his visits should prove of no small value to the Detroit Manual Training Club. The Club is to be commended for its progressive policy of sending one of its members to other cities in the interests of their profession.

INTENSIVE INDUSTRIAL WORK AT STOUT INSTITUTE.

As an aid to the problem of vocational guidance along lines of industrial work, the Stout Institute is offering this year to boys in the Menomonie, Wisconsin public schools the following lines of instruction. There are sixteen subjects, each taught for two periods a day, every day in the week for nine weeks. All students in the seventh and eighth grades and first two years of high school, change subjects in a regular system of rotation every nine weeks. The subjects are:

Seventh grade: architectural drawing, bricklaying, carpentry, plumbing.
Eighth grade: mechanical drawing, cabinet making, forging, printing.
First year high school: freehand drawing, joinery, wood turning, printing.
Second year high school: mechanical drawing, pattern making, foundry work, machine shop work.

Students in the last two years of the high school course are allowed to specialize in any one of the eight following elective subjects: machine drawing, foundry work, machine shop practice, forging, carpentry, plumbing, bricklaying, printing. The subjects selected may be taken for two periods a day every day for two years.



A WELL ORGANIZED STOCK CASE IN A MANUAL TRAINING CENTER IN RICHMOND, VA. A SUGGESTION THAT IS EASY TO ADOPT.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor

LIBRARY TABLE[1].

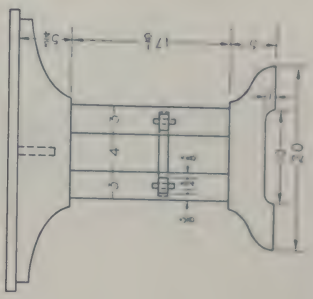
Students often come to the workshop without training in mechanical drawing or furniture design, and lacking in definite ideas of the particular thing they wish to make. This problem is met in the Manual Arts Department of the State Normal School, Stevens Point, Wis., by the use of "blank" drawings which give the essential features of a project such as principal dimensions, type of construction, etc. The student may not do less than this, but is encouraged to modify and refine as far as his time and ability permit. All projects made in the shop are recorded by means of a blueprint or drawing and a photograph.

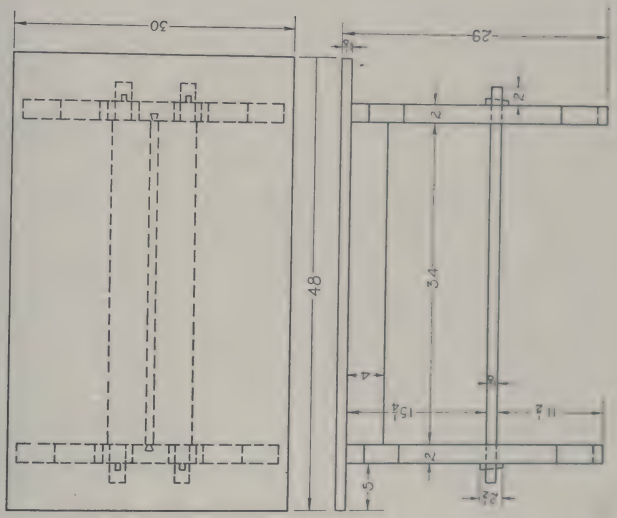


These serve as a basis for the use of later students. In addition to this, pieces of furniture are made to special order to fit in certain known environments. The accompanying photograph and drawing give an example of such orders. This library table involves mortise-and-tenon construction, and was made of quartered white oak.

[1] The material presented in this issue, with the exception of the loom, was contributed by Clyde Bowman, Director Dept. of Manual Arts, State Normal School, Stevens Point, Wis.

LIBRARY TABLE

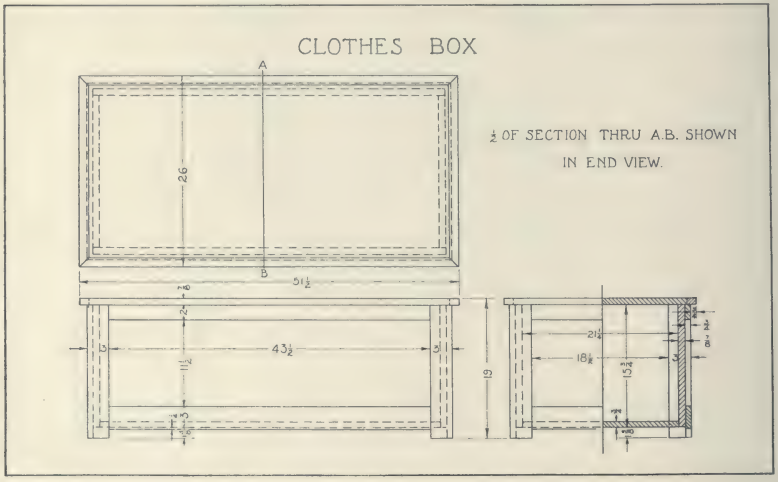






CLOTHES BOX.

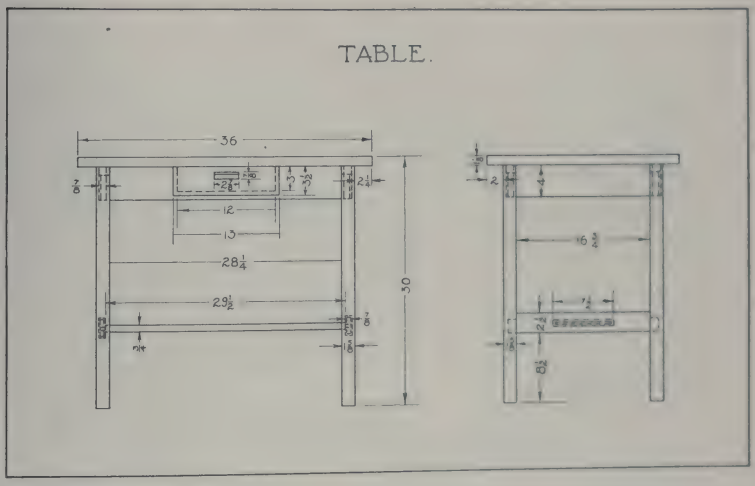
This box is made of basswood, lined with ¼" cedar. The outside is covered with matting; the corner strips being made of birch finished with mahogany stain. The sides of the box are fastened to the ends with screws; the strips are attached in the same manner. The cedar lining is held in place with small brads.





SMALL TABLE.

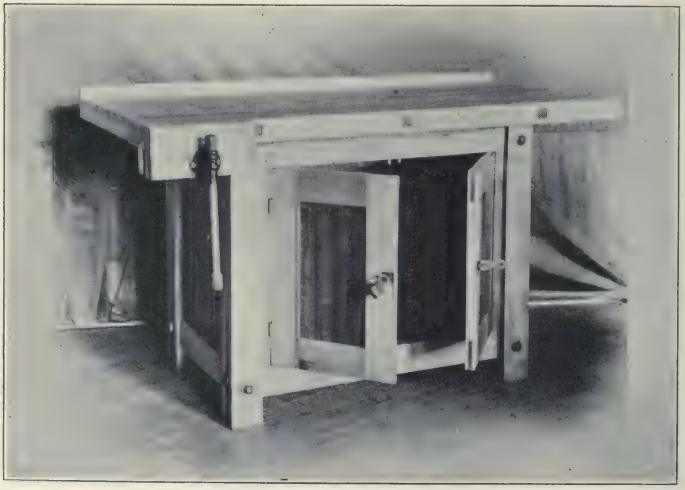
This project is used as a basis for the study of table sizes, and construction. The joints used are of the mortise-and-tenon type. A modification of the ends as to variety of treatment, width of rail, etc., is encouraged.





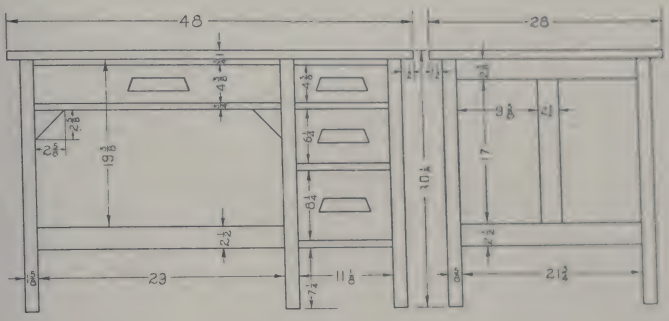
WRITING DESK.

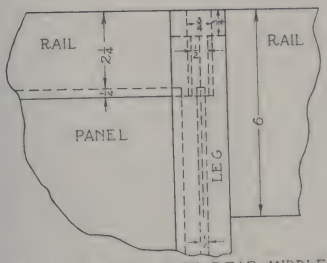
The details of construction of this project are evident from the drawing and photograph. Two sets of drawers are sometimes made in place of the one shown. Modifications of drawer pulls are possible.



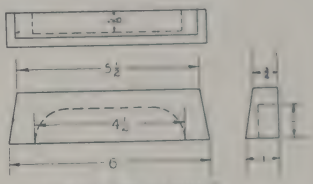
WORK BENCH.

WRITING DESK

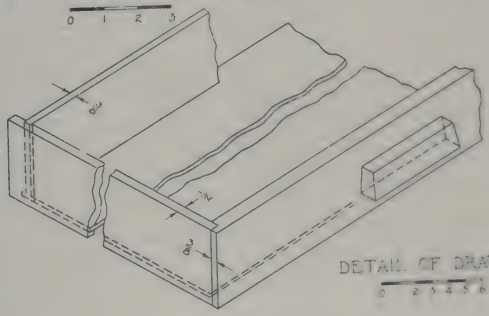




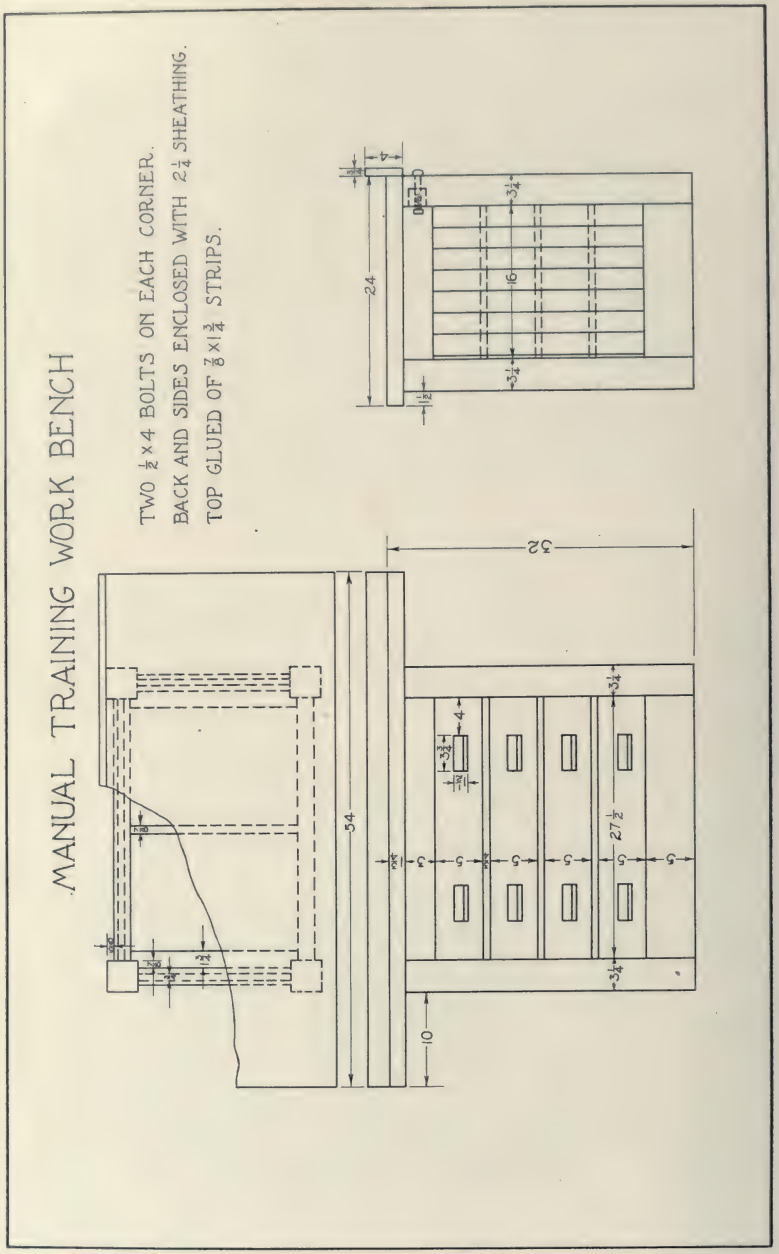
DETAIL OF OUTSIDE OF REAR MIDDLE LEG



DETAIL OF HANDLE



DETAIL OF DRAWER


MANUAL TRAINING WORK BENCH
TWO ½×4 BOLTS ON EACH CORNER.
BACK AND SIDES ENCLOSED WITH 2¼ SHEATHING.
TOP GLUED OF 7/8×1¾ STRIPS.
24
16
54
52
27½
10
4

WORK BENCH.

This bench is made of hard maple thruout except drawer construction. Legs are glued up of at least two pieces. Ends and back are made of ¾" maple sheathing. This bench is usually fitted with a No. 80 Abernathy head vise and a Sheldon swivel tail vise; ½" x 4½" bolts are used to hold frame together. Cost, exclusive of vises is about $4.50. The drawing shows four drawers, while photograph gives cupboard space only. A combination of the two would be more desirable.

NORWEGIAN LOOM.

This style of loom is used by the Norwegian peasants for small rugs, tapestry, and fancy weaving. It has been handed down to the present generation from the time of the Vikings who were expert craftsmen. Some of their beautiful tapestry can still be seen in the many historic museums of Norway.

This loom was made by three boys in the eighth grade of the Maple Ave. School of Morristown, New Jersey, and is now being used in the same school with great success in the class for backward children. The best way to thread such a loom is to have the warp cut in as many lengths as there are spaces in the reed. Number nine reed, which is best suited for ordinary use, requires two hundred and ten (210) lengths about twenty yards long. Take each end thru the reed, then thru the heddles. The first thread will go thru the heddle eye in the lower heddles and between in the upper. The next will go between the heddles in the lower and thru the heddle eye in the upper heddles and so on, alternating until all are threaded. All ends are then brought over the cross-bar and tied to a dowel which again is tied in the groove in the beam. Proceed to wind up until all the warp is on the beam. The lower ends are fastened to a dowel or round stick and tied in the lower roll. The heddles, reed, and shuttle, may be purchased from any firm dealing in weaver's supplies. Any rug up to 24 inches in width may be made on this loom. In length it may run up to 30 yards.

The important dimensions of the loom are as follows:

Total height 5′ 4½″.

Depth of base 2′ 2″.

Width between upright standards 2′ 3¼″.

Diameter of ratchet 4¾″.

Center of top ratchet 4′ 7¼″ from base and 3¾″ from front of upright.

Center of bottom ratchet 22⅛″ from base and 5″ from front of upright.

Size of bolts which hold reed frame ⅝″ x 8¼″.

Length of four arms attached to heddle frames 17″.

Connecting rods between lever and reeds 7¼″ long.

The ratchets, four arms, and connecting rods are made of ⅛″1 iron.

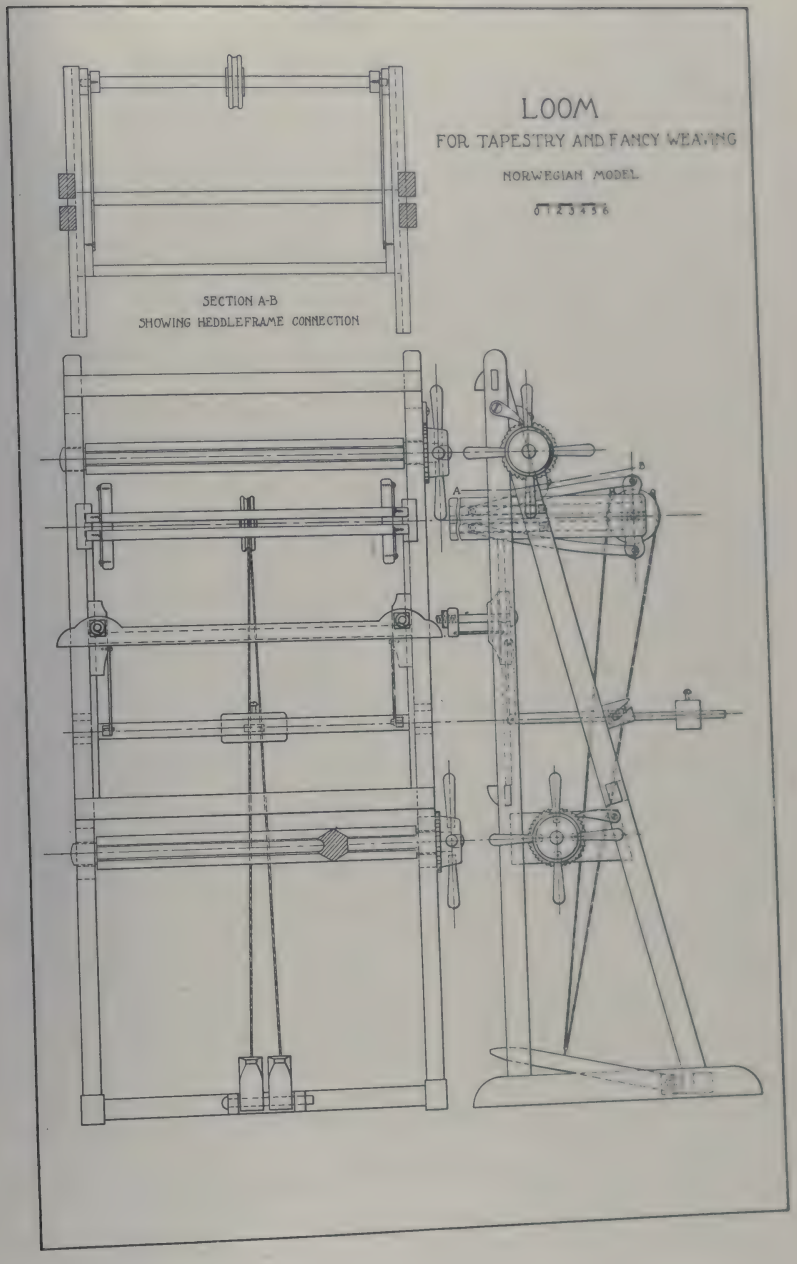
Vertical members of the frame are of 1½″ x 2″ stock.

Horizontal members of the base are of 1¾″ x 2½″ stock.

—T. Lied, Morristown, N. J.



NORWEGIAN LOOM.


LOOM
FOR TAPESTRY AND FANCY WEAVING
NORWEGIAN MODEL
0 1 2 3 4 5 6
SECTION A-B
SHOWING HEDDLEFRAME CONNECTION
A
B

REVIEWS

Decorative Design, by Joseph Cummings Chase. John Wiley & Sons, New York. 8 x 10¾ inches; 83 pages; price, $1.50.

This is another book in the "Wiley Technical Series" written for text-book use. The subject of decorative design has been treated under four headings, with great emphasis upon the practical application of the methods set forth.

Section I. Theory of Design. Under this heading the author has considered the kinds of design, systems of arrangement for "all-over" patterns, symmetry and balance, abstract forms and forms conventionalized from nature, "rules" or "forms" of order and principles pertaining to orderly arrangement.

Section II. Sources of Conventionalized Motives. This is a particularly helpful chapter to young designers. It not only shows many choice motives, but it shows the steps by which the designer arrived at certain conventionalizations adapted to various uses in decorative design.

Section III. Lettering—Book Covers—Posters. The importance of dignified lettering for book and catalog covers, title pages, bookplates, posters, trademarks and advertisements is discussed and illustrated.

Section IV. Board of Regents' Problems—Historic Ornament. A list of the problems in decorative design which have been propounded by the Board of Regents of the State of New York are here given to show the wide range of subjects that the study of decorative design is expected to embrace, and because its consideration may prevent students from pursuing a few types of problems to the exclusion of many others. A page is devoted to illustrations of styles of historic ornament including: Egyptian, Greek, Roman, Gothic and Saracenic. A bibliography of helpful books is appended to this chapter.

A careful examination of the book impresses one with the author's intent to make the book of the greatest possible help to the earnest student.

Interior Decoration: Its Principles and Practice, by Frank Alvah Parsons, president of New York School of Fine and Applied Art. Doubleday, Page and Company, New York, 1915. 6½ x 9¼ inches; 284 pages + 68 half-tone illustrations printed on inserts; price, $3.

This book will be a rare delight to those who appreciate Emerson's phrase, "the tyranny of things." It is written in a charming style and contains a wealth of information.

Part I defines and discusses the various factors entering into decoration, including color, the principles of form, balance and movement, emphasis and unity, and scale, motifs and texture as they relate to furnishing and decorating.

Part II treats of historic art periods and the ideas which they represent, and includes the French, English, and Dutch influences. The period of individual creation is also covered embracing the names of Chippendale, Hepplewhite, Sheraton, Adam and others. The colonial style, its history and meaning is also fully set forth.

Part III gives practical concrete suggestions concerning individual furnishings of the modern house.

In subject-matter and method of handling this book is the most complete in its field. It is a book with a purpose, but withal is modestly offered.

Practical Inlay Work, by Oscar James Palmer. Published by the Peerless Publishing Co., Mangum, Oklahoma. 5 x 7 inches; 22 pages; price, 50 cents.

This booklet briefly presents the fundamentals of inlay work. The tools used in inlaying, the primary methods employed in the making of inlay, and the application of the same to an object are discussed. Practical application is shown thru the use of diagrams.

The book is elementary in character. It would be of value to a high school student who is doing his first pieces of inlay work.

Field and Laboratory Studies of Soils, by A. G. McCall. John Wiley and Sons, New York. 5 x 7 inches; 85 pages; 32 figures; price, 75 cents, net.

This book is a laboratory and field manual for elementary students of agriculture. The content is grouped into a series of simple exercises in soil experimentation. Little expensive equipment is necessary as most of the apparatus needed can be made by the students and teacher.

Most of the exercises are intended for the laboratory. The effects of the phenomena of nature on different kinds of soil; the testing of soils and studies of the effects of scientific cultivation on soil and crops are some of the phases of soil study which are treated in the book.

Field and Laboratory Studies of Crops, by A. G. McCall. John Wiley and Sons, New York. 5 x 7 inches; 133 pages; 54 figures; price, 85 cents, net.

This book is a companion volume to *Field and Laboratory Studies of Soils* by the same author. It is an elementary manual in crop studies for students of agriculture.

The aim is to present thru exercises, some of the fundamentals of plant growth and the application of these principles to crop production and improvement. The common small grains, corn, the grasses, potatoes, cotton and weeds receive treatment. The planting, germination and growth of the common seeds are fully explained and well illustrated. The exercises on such subjects as selection and storage of seed grains, vitality of seeds and the treatment for common diseases add greatly to the value of the book.

Practical Gas-Fitting, by J. W. Huges and W. B. Gray. This is a reprint from *The Metalworker, Plumber and Steam-Fitter*. Published by David Williams Company, 239-241 West 39th Street, New York. Copyrighted 1896, present edition 1906. 5½ x 7¾ inches; 116 pages; price, $1.00.

The running of mains, laying of pipes and placing of gas fixtures in buildings are fully described in this book. The text is a little unusual because the two parts cover practically the same ground tho they were prepared by two men, both practical gas fitters.

The text was originally prepared to fill a demand by the trade for "a concise practical account of the best methods of doing gas-fitting." It should prove of equal value to teachers and students of trade and industrial schools offering courses in gas-fitting. It is adapted for use either as a text or for supplementary reading.

Directions for Designing, Making and Operating High-Pressure Transformers, by F. E. Austin. An illustrated 46 page booklet; price, 50 cents. For sale by F. E. Austin, 11 South Park, Hanover, N. H.

This booklet contains sketches, drawings, necessary data and working directions for constructing and operating several types of simple step-up transformers.

Freehand Lettering, by Louis L. Thurston. Published by B. D. Berry Company, 623 S. Wabash Avenue, Chicago. 8½ x 12 inches; 20 plates; price, 40 cents.

This is a course of exercises in freehand lettering adapted for classes in mechanical drawing. Both capitals and lower case letters are outlined. The "tracing method" is employed. The student first traces over the complete letter a sufficient number of times to make the movement for the letter automatic. Short dashes are then given which only suggest the outline of the letter. The student must fill in between the dashes and complete the letter. At the conclusion the student must make the entire letter himself. Particular emphasis is laid on the correct order and direction of the strokes forming the various letters.

How to Make a Transformer for Low Pressures, by F. E. Austin. An illustrated, 14-page booklet; price 25 cents post paid. For sale by the author, F. E. Austin, 11 South Park, Hanover, N. H.

This booklet presents sketches and working directions for the building of a step-down transformer without the need of expensive tools and machinery. It is suitable for use in a house circuit where the pressure is not more than 110 volts and the frequency about 60 cycles.

Mechanical Drawing for Industrial and Continuation Schools, by Philip W. Hutton. Scott, Foresman and Company, Chicago and New York. 7½ x 9 inches; 176 pages; 85 full page illustration; price, 90 cents.

This book is a combined text and course of problems. An elementary course in principles is first presented. This is followed by exercises, conventions and practical problems suited to the needs of those engaged in various lines of industrial work. This latter part of the work is composed of mechanical drawings classified under the following heads: woodworking, being manual training problems; sheet metal, machine and architectural drawing; electrical and gas plumbing conventions; and problems in electric wiring, pipe fitting plumbing and brick work.

The Orders of Architecture, by A. Benton Greenburg. John Wiley and Sons, New York. 8 x 10½ inches; 20 pages; price, 50 cents.

This book is composed of a series of drawing plates showing the Roman orders of architecture. There are also plates of details of the orders and some perspective drawings of various parts. It is very suitable as a drafting manual for a class making a study of classic models.

Technical Trigonometry, volume IV of *Constructive Text-book of Practical Mathematics,* by Horace Wilbur Marsh. John Wiley and Sons, New York. 5¼ x 8 inches; 232 pages; 107 figures; price, $1.50, net.

This book was written with a very definite end in view; namely—the creating of a text which would eliminate "the familiar trigonometric juggling—the problems of ruins and inacessible crags," and substituting in place of this type of problem, the practical knowledge underlying the technical side of present day industries. Simplicity has taken the place of the former confusion and complexity of subject-matter. Strong emphasis is laid on the principle that the correct result is the object of supreme importance.

First Year Mathematics, by Ernest R. Breslich. The University of Chicago Press. 5 x 7½ inches; 208 pages; price, $1.00, net, postage extra.

The simpler principles of algebra, geometry and trigonometry have been brought together into one correlated course of mathematics for first year students in secondary schools. This makes a complete introduction to the more complex branches of each of these mathematical sciences.

The relationship existing between the elementary portions of these three branches of mathematics is very close and it is believed that a fusion of all would fix in the students' mind the interdependence of one on the other. By following the course here presented many students who become discouraged by failure in one branch of mathematics, when it is taught as a final science, would not be led to believe that they could not be successful in another branch. Such a course as this one, it is believed, would for many be an incentive to more advanced work in at least one if not all branches of mathematics.

RECEIVED

A New Scale of Mental and Physical Measurements for Adolescents, and Some of Its Uses, by Helen Thompson Wolley. A reprint from November, 1915, *Journal of Educational Psychology.*

Home Projects in Secondary Courses in Agriculture, by H. P. Barrows. Bulletin No. 346, U. S. Department of Agriculture, Washington, D. C.

Sharpening Stones—History and Development. Published by the Pike Manufacturing Company, Pike, N. H.

Educational and Other Employe Relations. This pamphlet includes outlines of educational courses conducted by The New York Edison Company.

The Pennsylvania Child Labor Act and Continuation Schools. This is Bulletin No. 5 of the Bureau of Vocational Education, State Board of Education, Harrisburg, Pa.

The Colorado Industrial Plan, by John D. Rockerfeller, Jr. A reprint from *Atlantic Monthly,* January, 1916.

Empire State Vocational Conference Bulletin. This is a report of the Albany-Schenectady Conference. Published by the State Education Department, Albany, N. Y.

The Educational Bi-Monthly, February, 1916. This issue contains the first of a series of courses in Construction Work in the Lower Grades. The aim is

to base the courses on industrial activities. The course presented in this issue is Book Making and Supplementary Constructions. Published by the Chicago Normal School Press, Chicago, Ill.

A Limestone Tester, by Cyril G. Hopkins. Circular No. 185 of the Agricultural Experiment Station, University of Illinois, Urbana, Ill.

Health of School Children—II, by W. H. Heck. Bulletin No. 50, 1915, Department of Interior, Bureau of Education, Washington, D. C.

Handbook for Rural Teachers, by Addie M. Ayer. This booklet presents the various problems which the present-day rural teacher has to meet. Idaho Bulletin of Education Vol. II, No. 1. Published by the State Board of Education, Boise, Idaho.

A School of Today, The Newton Vocational School, by Morris Lombard. A reprint from the December, 1915, issue of the *National Magazine.* Chapple Publishing Co.

Boys' and Girls' Clubs, by S. T. Newton, Bulletin No. 15, 1916. Manitoba Agricultural College, Winnipeg, Canada.

Handicraft Club Woodwork, Part I; Iowa Boys' and Girls' Clubs. This is a course of woodworking problems presented in such a way as does not require the services of an instructor. It is intended for home work. Junior Circular No. 30, Departments of Agriculture and Engineering Extension, Ames, Iowa.

Woodworking Problems. A course of problems in woodwork with working instructions, for use in connection with Boys' and Girls' Club contests. Bulletin No. 20, 1916, Manitoba Agricultural College, Winnipeg, Canada.

Outlines in Manual Training Course in Woodwork, for seventh and eighth grades and high school. This bulletin presents the various woodworking tools, common processes involved in woodwork, and a series of projects with working instructions. Issued by the Department of Public Instruction, State of Iowa, Des Moines, Iowa.

Library and Laboratory Equipment for Recognized High Schools in Illinois. Circular 94, Department of Public Instruction, Springfield, Ill.

Fifteenth Annual Report of the Bureau of Civil Service, to the Governor-General of the Philippine Islands for the year ending December 31, 1914. Bureau of Printing, Manila, P. I.

Vegetable Gardening. Leaflet No. 4, Department of Public Instruction, Trenton, N. J.

English Derivatives, by B. K. Benson. A practical class book of 166 pages. D. C. Heath & Co.

MANUAL TRAINING AND VOCATIONAL EDUCATION

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FOREWORD

THE word "prevocational" came into our educational terminology at a time when the word "vocational" was beginning to loom up large on the educational horizon. It was intended to stand for that kind of grammar grade or middle school training that is needed by the boy or the girl who is headed toward industry, but not yet old enough to be in the trade or vocational school. It meant a new type, or at least a much modified type, of general training especially suited to the needs of those who were to become industrial workers. But now that pupils passing thru such a course of training sometimes go to the high school and on to college instead of directly to industry, and the consequent fact that the prevocational school is quite largely a trying-out school, and the further fact that out of much discussion and many experiments there seems to be emerging a new type of middle school known as the junior high school, the question of the need of the term "prevocational" has been raised. Our readers will be interested in the discussion of this question by *Dr. Frederick G. Bonser* of Teachers College, New York City, which we present as the leading article in this issue.

Continuing our efforts to present helpful articles on methods of teaching the manual arts, we are especially glad to add a group of four articles on this general subject in the present issue. *Charles Willis Clark,* of Syracuse, N. Y., presents an argument for the adoption of textbooks in manual training classes in secondary schools. In a measure the textbook helps to solve the problem of presenting work to a large class. *Leonard Righter,* assistant superintendent, in charge of education, at the House of Refuge on Randall's Island, New York City, presents arguments for the adoption of a modified system of science laboratory sheets for industrial arts classes. He would allow for the expression of more individuality in the pupil's work. *R. H. Rodgers* of Stout Institute shows why successful teaching demands daily preparation, and presents typical lesson plans illustrating how the analysis of subject-matter and processes may be accomplished. *Leon L. Winslow* of the State Normal School, Bowling Green, Ohio, shows how new life has been put into some old-time projects by changing their constructive design.

This issue contains the third article in the very practical and helpful series by *L. Day Perry* of Joliet, Illinois, and the third installment of the summary of the Cleveland Survey by *William E. Roberts.* Both of these are sure to be appreciated by our subscribers who have read the former articles.

This Magazine is kept for sale at McClurg's in Chicago, and Brentano's in New York.

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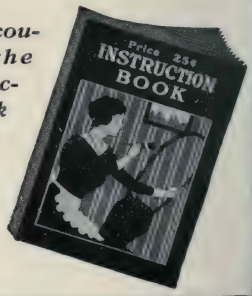
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FIELD NOTES

REPORTS have been received by the Pennsylvania Bureau of Vocational Education which indicate that there are in operation in 109 school districts of that state, 444 continuation school classes. In order to accommodate these continuation classes, it has been necessary for the various school districts to provide and equip 341 class rooms and employ 250 special continuation school teachers. There are 23 classes being held in factories and 25 in stores. These are under the jurisdiction of the school authorities and offer a splendid opportunity for correlated work. Instruction in shopwork and in home activities is given by specially prepared teachers who are employed by districts where continuation schools have been established. The members of the Division of Industrial Education, under the directorship of Millard B. King, are conducting many industrial surveys in cities and towns of the Commonwealth for the purpose of working out courses for the continuation schools that will fit the particular needs of each locality.

It is expected that there will be schools in over 200 districts by September 1st. Wherever possible the shopwork is of such a character as to be helpful to the boys in their daily occupations. The work for the girls is centered around the activities of the home. It is gratifying to know that the numerous statements from school authorities show that the continuation schools are meeting a long felt need. Employers are cooperating, and in many instances have put themselves to considerable inconvenience, to accommodate the school authorities. Everything points to a very successful continuation school system in Pennsylvania.

AN EDUCATIONAL CLINIC.

On February 17th the Department of Public Instruction of Pennsylvania held an "educational clinic" at Harrisburg. Millard B. King, state director of industrial education and E. E. Bach, supervising principal of schools of Ellsworth, together with the Ellsworth Colliery Company have been busy for several months working out a plan of education for the town of Ellsworth. Mr. Bach showed by means of motion pictures how the plans were put in operation and explained the whole educational system of that town, which is in many ways unique. Ellsworth is situated in the coal regions and practically all of its inhabitants are engaged in coal mining. There are fourteen nationalities represented in the population, and the first big plan was to make Americans, create patriotism and produce clean, wholesome citizens. Industrial education came next in importance with a splendid system of shop training for the boys, and home-making for the girls. This instruction in home-making does not end with the close of the school day, but is continued by the teachers visiting the homes of the girls and assisting them with further advice and help. The mothers as well as the girls are ready to accept any suggestions and aid offered and the teacher is always made welcome in the homes. For the boys the school shops are open for all who care to work after school hours. There they can come to make things for use in their homes and do whatever repair work is necessary.

Mr. Bach is not only supervising principal of the Ellsworth Schools but is also employed by the Ellsworth Colliery Company as their sociological expert. All the social activities, playgrounds, welfare work, school gardens, athletics, etc., are under his jurisdiction, so it might be said that the school work in Ellsworth goes on every day of the week and every week of the year.

"Safety first" is taught in all of the schools and once each year there is a big demonstration of mine rescue work, first aid, etc. At the clinic Mr. Bach demonstrated by moving pictures how the many problems had been solved to make Ellsworth a cleaner, healthier and better town. Besides the Department of Public Instruction there were representatives from the Departments of Labor and Industry, Mines, and Health at the meeting. After the entire scheme in Ellsworth has been perfected, the work will be shown and explained at some of the big educational meetings of the country.

(*Continued on p. VI.*)

FIELD NOTES—(*Continued from p. V.*)

HOW IT IS DONE IN NEW JERSEY.

On February 5th at the Dickinson High School, Jersey City, N. J., one hundred teachers of industrial subjects gathered in an all-day session which was held for the purpose of effecting a county organization that would include Jersey City, Hoboken, Bayonne and several other cities.

E. G. Traua, director of industrial education in Hoboken, acted as chairman. At the opening session E. A. Reuther, state supervisor of manual training, delivered an earnest address emphasizing the mutual helpfulness which a county organization would afford. The assembly then separated into groups according to the special subjects in which the individual teachers were interested. The several groups included teachers of machine shop practice, woodworking, domestic science, sewing, millinery, drawing, and industrial-academic work. Each group affected a provisional organization of its own and elected a member to represent them on the committee on organization. At the afternoon session F. E. Mathewson, director of the technical and industrial department of the Dickinson High School, discussed informally the development of this department, pointing out especially the increasing demand for the various lines of work which it offers. The closing address was delivered by L. H. Carris, assistant state commissioner of education in charge of industrial work, who gave an interesting report of the Minneapolis meeting of the National Society for the promotion of Industrial Education.

This was followed by the report of the Committee on Organization of which M. W. Hayes, principal of the Bayonne Vocational School, was chairman. It suggested that the entire management of the association be placed in the hands of an Executive Council to consist of three members-at-large and one representative from each of the special groups which had previously organized. This plan was accepted and the following members of the Council were then elected:

Members-at-large, E. G. Traua, F. E. Mathewson and C. C. Stimets; Machine-Shop Practice, E. R. Corr; Woodworking, E. L. Wagoner; Sewing and Millinery, Miss Frances Cassidy; Drawing, W. O. Hamblin; Domestic Science, Miss C. E. Pratt; Industrial-Academic Work, Mrs. C. K. Carswell.

After accepting an invitation from Mr. Traua to hold the next meeting in Hoboken, the meeting adjourned.

INDIANS MAKING AUTOMOBILES.

From time to time students in the United States Indian School, Carlisle, Pa., who have proved themselves worthy and who have shown ability for advanced training in their trades or along general lines as leaders and foremen, are given the opportunity of entering large manufacturing and industrial plants for training as special skilled workmen or as foremen. Nineteen Carlisle Students are now taking a student's course in the Ford Automobile Works, Detroit, Michigan. They are required to attend night school and to observe the general rules of the "Outing System." Concerning these Carlisle Indian students, an officer of the Ford Automobile Company said: "They have shown more than the average aptitude and have made better progress than the average student taking similar courses in our works. We have been impressed with the concentration they show, their regularity of attendance, and the patience and determination they exercise in mastering all the details of the work with which they come in contact."

TRAINING MANUAL ARTS TEACHERS IN CHINA.

All manual arts teachers have problems peculiar to the varying conditions under which they work. Frank A. Foster, a Worcester Polytechnic Institute graduate, who is teaching in Paotingfu, China, is having an experience that presents more than the uusal handicaps. In a letter received by us recently he wrote as follows :

"I have undertaken to take a special class through a course in manual training in the Chihli Higher Normal College, in Paotingfu. It is a class which the Provincial government of Chihli Province wishes to prepare for teaching manual training in the lower intermediate and primary

(*Continued on p. VIII.*)

THE STOUT INSTITUTE

SUMMER SESSION
1916
JULY 31—SEPTEMBER 1

EIGHTY-SIX COURSES
IN
MANUAL ARTS AND HOUSEHOLD ARTS

Drawing and Design	Athletic Courses
Metal Work Courses	Playground Work
Wood Work Courses	Sewing and Dressmaking
Building Trades	Millinery and Art Needlework
Machine Trades	Food Study and Cookery
Printing Courses	Chemistry and Microbiology
Manual Arts for Rural Schools	Home and Social Economics
Primary Handwork	Household Arts for Rural Schools
Gymnastics and Swimming	Pedagogical Courses

Special exercises daily in the new auditorium of general interest to Summer Session students.

Lectures, illustrated talks, exhibitions, demonstrations.

For detailed information address

L. D. Harvey, President The Stout Institute
Menomonie, Wisconsin.

schools. We have started out with 45 students. It is somewhat in the nature of an experiment, but if they will come forward with the tools and equipment which they have promised, I guess we can get them through all right. I have to do all my work through interpreters, as my Chinese is not sufficient and the students' English is not enough to bridge the gap. Most of them have had some English. I have to coach the three interpreters, write my own text books and supervise the work of my Chinese office boy who puts my work into writing for duplication. There is only one other foreign teacher in the school, an English teacher of English. There are only about 25 foreigners in the whole city (100,000) and they are all missionaries.

BIRD HOUSE CONTEST IN ST. PAUL.

The interest in the bird house contest in St. Paul increases with each passing week. The exhibit will be held in the Auditorium from April 10th to 15th. An interesting feature of this year's contest was the illustrated bird house lecture given by Donald V. Ferguson, supervisor of manual training, in which various types of bird houses and pictures of the birds that dwell in houses were shown on the screen. The rules governing the contest permit the entrance of bird shelters to be fastened to the side of a shed, or barn, to be placed in a tree, or to swing suspended. In every case, however, the work of planning, designing, building, and finishing the bird houses must be done by the boys without assistance.

THE COMING MEETING.

The coming annual meeting of the Western Drawing and Manual Training Association, to be held in Grand Rapids, Mich., May 3rd to 6th, inclusive, promises to be the best in the history of this progressive organization. A very excellent program has been prepared which includes the following speakers: Woodbridge N. Ferris, Governor of Michigan, Lorado Taft, sculptor, Dr. C. A. Prosser, director of Dunwoody Institute, Minneapolis, and Dr. James Parton Haney, head of the art department of the New York City high schools.

Special care has been given to providing ample space for both the educational and commercial exhibits. The committee has secured the ground floor of the Klingman Furniture Exhibition Building, thus having a floor space of 35,000 square feet for their needs. A special feature will be made of the exhibit of printing. All of the schools of the Mississippi Valley in which printing is taught have been asked to send an exhibit of their work, and this will be shown in one department of the main exhibit.

The Pantlind Hotel has been designated as headquarters and the annual banquet will be held there the evening of May 3.

The Vocational Education Association of Southeastern New York held a conference in Brooklyn on Friday and Saturday, March 3rd and 4th. On Friday the time was spent in visiting the four vocational schools and seven prevocational schools in Brooklyn and New York City, and also Pratt Institute. Saturday morning was given over to the following fine program of addresses: "Continuation and Part-time Cooperative Plans" by Dr. John H. Haaren, associate superintendent of schools, New York City; "The Smith-Hughes Bill as an Asset for Industrial Education" by Alvin E. Dodd, secretary of the National Society for the Promotion of Industrial Education; "Betterment of the Condition of Girls and Young Women in Great Cities" by Miss Florence M. Marshall, director of the Manhattan Trade School for Girls, New York City; "Vocational and Prevocational Education" by Dr. William L. Ettinger, associate superintendent of schools, New York City; "Household Arts Problems" by Miss Isabel E. Lord, director, School of Household Science and Arts, Pratt Institute, Brooklyn; "Lessons from New York City's Experience" by John Martin, chairman of the Committee on Vocational Education, Board of Education, New York City.

Following the noon-day luncheon, Dr. Arthur D. Dean, director of agricultural and industrial education for the State of New York, and Dr. Frederick G. Bonser, professor of industrial arts, Columbia University, addressed the Association.

The proposed school survey in Columbus, Ohio, provides for the services of experts. Dr. Ellwood P. Cubberley, of Leland Stanford Jr. University,

(*Continued on p. X.*)



BRADLEY POLYTECHNIC INSTITUTE
SUMMER SCHOOL

JUNE 19 to JULY 21

THIRTEENTH YEAR——————TWENTY-NINE COURSES

PROGRAM, 1916

PEDAGOGY
- Psychology
- Organization of Manual Training
- Administration of Domestic Art

WOODWORKING
- Woodworking
- Furniture Making
- Use of Woodworking Machinery
- Wood-Turning and Pattern-Making
- Wood-Finishing
- Upholstery
- Cement Construction

METALWORKING
- Forging
- Machine-shop Practice
- Automobile Garage Work

DRAWING
- Mechanical Drawing
- Machine Drawing
- Architectural Drawing
- Freehand Drawing

DESIGN AND CRAFT WORK
- Design and Leather Work
- Woodwork Design
- Art Metal Work

DOMESTIC ART
- Administration of Domestic Art
- Sewing and Textiles
- Dressmaking and Art Needlework
- Milline y

DOMESTIC SCIENCE
- Elementary Cooking
- Advanced Cooking

SCIENCE
- Chemistry
- Household Bacteriology

GENERAL
- Nature Study
- English
- Economic History

A SCHOOL FOR SPECIALISTS

More than half of the students who have attended this Summer School during the past ten years have been supervisors, directors and special teachers of one or more branches of Manual Arts or Domestic Economy.

Send for descriptive circular.

BRADLEY POLYTECHNIC INSTITUTE - - PEORIA, ILL.

and Dr. George D. Strayer, of Columbia University, have recently been in conference with the local committee in reference to the matter. Dr. Cubberley has estimated that the entire cost, including the printing of the report, would be $10,000. In view of the contemplated expenditure of $2,000,000 on a building program the committee believes that the benefits of an immediate survey would ultimately save several times the cost.

Under the auspices of the Educational Department of the College of Liberal Arts of Boston University, a series of three lectures on vocational guidance have just been given by experts in this field. Professor Frederick G. Bonser, of Columbia University, delivered the first lecture on "The School Curriculum as a Means of Revealing Individual Differences Basic to Vocational Guidance." The second lecture was given by Miss M. Edith Campbell, head of the Schmidlapp Bureau for Women and Girls at Cincinnati, with the subject "The Public Schools' Guardianship of Children's Work." Dr. Ellwood P. Cubberley, of Leland Stanford Jr. University, closed the series with a discussion of "Recent Developments in Secondary Education in California."

A year's course in vocational guidance is announced by the Women's Educational and Industrial Union of Boston, beginning September 20, 1916. The course aims to fit women of adequate preliminary training to become vocational advisers in grammar and high schools or in social agencies by providing them with a knowledge of industrial conditions and methods of industrial investigation and the use of statistics; and by supplying such other training as is essential, including some practical application of the principle and methods studied. For the year 1916-1917 the class will be limited to six women who have had experience in teaching, or social work, and who in the judgment of the director seem especially fitted to profit by the training offered. Application must be made in person to the Director, Miss Florence Jackson, or to her representative.

At the annual meeting of the Southwest Oklahoma Teachers' Association, held in Altus, Okla., February 17th to 19th, a sectional meeting of the Industrial Arts Association was held. The program provided for a general discussion of each of the subjects presented: "How to Place Vocational Training on a Par With All the Phases of Education in This Part of the State" by G. E. Davenport, Elk City; "The Manual Training Subjects That Would Be Most Practical to Teach in Our High Schools and Why" by Fred C. McCrea, Hobart; "Methods of Procedure in Assembling Furniture and All Glue Work in the Shop" by B. J. McGee, Lawton; "Advisability of the Manual Arts in Rural Schools of Southwestern Oklahoma" by F. H. McCrea, Weatherford; "Individual Work vs. General Work; A Feasible Plan for the Solution of This Problem." Round Table discussion led by O. J. Palmer, Mangum.

The city of Manchester, Conn., has the only school in the world which offers instruction in practically every branch of silk textile work. Originally started by the well-known Cheney Brothers, it was finally taken over by the state, and is today one of the most modern trade schools in the United States. A certificate of graduation from the textile school is given upon the completion of 2400 hours of work, and the holders of these certificates are given preference in obtaining places in the mills.

Upon the organization of the Department of University Extension, the Massachusetts State Board of Education issued a bulletin giving complete information concerning the correspondence courses to be offered during the present year. These include quite a variety of subjects, covering language, history and government, economics, mathematics, commercial and management courses, drawing, courses in heating, ventilating and power plants, electricity, courses in structural, highway and hydraulic engineering, civil service, and agriculture. Dr. James A. Moyer is director of this work.

The Worcester Trade School, Worcester, Mass., recently closed for a week to enable the faculty to visit the trade and industrial schools

(*Continued on p. XII.*)

"Buffalo" Down Draft Forges



Double O. J. D.

The Ideal Unit for Manual Training Schools

This forge embodies all the advantages of the "Buffalo" patented **Down-Draft** principle. It is compact and neat in appearance, it has no light-obstructing and short-lived overhead piping, ashes can easily be cleaned out and all smoke and fumes are positively removed.

Equipped with large fire-pot, leaving ample room for fire-clay or fire-brick lining. Brass slide in blast gate cannot rust and stick. Furnished with water tanks and large coal bunker.

Standard sizes for all requirements.

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St. Louis Kansas City, Mo.



Every one who owns a Simonds Saw is proud of it—proud of its looks, but a whole lot prouder of its work. You've probably noticed that the

SIMONDS SAW

(Pronounced Si-monds)

you have will keep sharp for many years with ordinary home use. Simonds Steel is so tough and hard the teeth hold their sharp, quick-cutting points and do not lose their set. For the profsssional or amateur carpenter the best tools are the only ones worth while, and the best saw means a Simonds.

Simonds Special Crucible Steel is the basis of the extra-ordinary wearing quality of Simonds Saws. We make and temper our own steel by a special process to get the quality we can guarantee. You don't get it in other saws. That's why so many good carpenters choose Simonds Saws. Ask a good carpenter about them—or your dealer. Send for

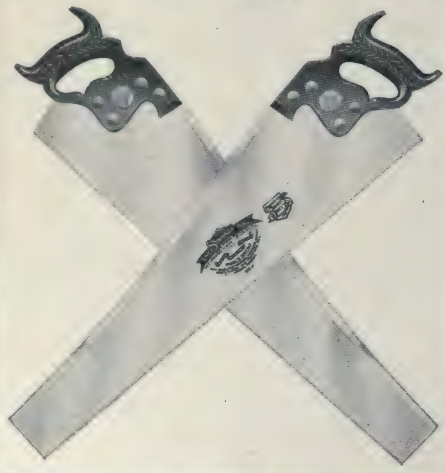
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SIMONDS MFG. CO. (Founded 1832) **Fitchburg, Mass.**

Chicago Portland San Francisco Montreal New Orleans Lockport, N. Y. New York Seattle



FIELD NOTES.

(*Continued from p. X.*)

in Springfield, Boston and Providence, R. I. They were divided into three groups, each visiting a different city. The Springfield group visited the Springfield Industrial School and the industrial schools in Holyoke and Westfield; the Boston party visited Wentworth Institute; and the Providence group visited the technical high school and the continuation school which is conducted at the plant of Brown & Sharpe Mfg. Company.

In the Industrial School for Boys at Shirley, Mass., a large variety of trades are taught including baking, blacksmithing, cabinet making, carpentry, shoemaking, dairy farming, janitor work, plumbing, steam fitting, electrical work, machine shop work, tailoring, and office work. When boys are committed to the school they are very carefully studied before being assigned to any of the trades. Two new buildings costing about $40,000, which have been erected largely by the labor of the boys, are nearing completion.

Charles H. Magee, acting director of education in the Philippines, has been appointed Insular purchasing agent to succeed Major Shields, who has resigned on account of ill health. Mr. Magee has been in the service of the Insular Government for fifteen years, and his promotion to this position is regarded as a just recognition of past services.

The annual meeting of the National Vocational Arts and Industrial Federation was held in Cincinnati from March 16 to 18, inclusive. This organization has for its object the correlation of the activities of the home, school and business world in such a way that they may be used as educational factors.

In these days when printing is becoming such a popular school subject, its introduction and development under varying conditions is of special interest. In the Cleveland school at Newark, N. J., both the boys and girls in the seventh and eighth grades take printing. The interest in this subject is indicated by the unrequired time that the pupils put in, many coming early and staying late either to work or observe others working.

(*Continued on p. XIV.*)

Build Your Own Benches

My drawings and vises put you on the easy way to get good benches cheap. Complete blue prints of this bench and details for One Dollar or free with order for 12 of my Standard Vises, at $1.50 each.



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"UNIVERSAL TRIMMERS"

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PRICE, $22.



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Enthusiasm,
Accurate Work
and
Rapid Progress
for your students

HENRY DISSTON & SONS, Inc.
PHILADELPHIA

See our Exhibit at
Hotel Ponchartrain, Detroit.

FIELD NOTES.

(*Continued from p. XII.*)

A course for play assistants has been organized in the Central High School, Minneapolis, which covers the history, theory and methods of physical education, the psychology and history of play, storytelling, first-aid methods, games, hygiene and gymnastic drills. The course is for one semester and is open only to senior or graduate girls.

Although established only in September, 1915, the mechanic arts department of the high school at Dover, N. H., has quite a complete equipment. It consists of 20 woodworking benches, 2 engine lathes, a drill press, milling machine, planer, grinder for machine tools, 2 forges and the necessary equipment for four stuednts, 4 anvils, and equipment for twenty pupils in mechanical drawing. Edmund W. Kempster, who organized the work, is director.

In the Village Street Chapel, a social center in Hartford, Conn., a boys' workshop has been opened under the direction of M. O. Whitney. An interesting feature of the first steps in the development of this work was the survey which the boys made of their homes with a view to making such improvements as would add to the convenience, comfort and good appearance of each home. The boys have entered into the work with earnestness, and immediately after the opportunity was offered one boy brought two chairs to be mended and another brought in a hat rack.

In West New York, N. J., the center of the embroidery manufacturing in this country, an evening class for embroidery menders has been organized which is meeting with a hearty response. The most highly specialized work done in these factories is mending, and since it is the ambition of every earnest worker to become a mender, it is not surprising that a class of 18 was quickly organized. This work is done on machines and requires great skill.

J. L. Folker, director of manual training in Steelton, Pa., has introduced a course in bird house construction for the grammar school boys. He plans to have the boys set out the boxes and

(*Continued on p. XVIII.*)



Illustration of our New No. 25A Outfit

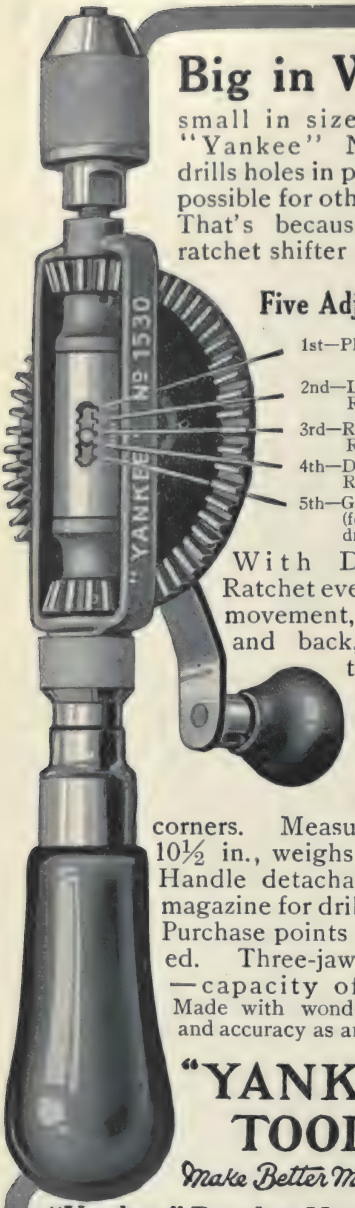
TOOLS AND BENCHES
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For years we have studied the requirements of schools and the experience gained proves that the *best* Tools and Benches are the cheapest in the long run. They are more uniform in quality, last longer, give better results and in every way are preferable. Our hobby *since 1848* has been QUALITY and we aim to carry *only the best.*

To directors and instructors and all those who are interested in Manual Training we will send our Tool Circular No. 35.

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HARDWARE, TOOLS AND SUPPLIES

4th Ave. and 13th St. NEW YORK, SINCE 1848



Big in Work

small in size — this "Yankee" No. 1530 drills holes in places impossible for other drills. That's because of its ratchet shifter with

Five Adjustments

1st—Plain Drill
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4th—Double Ratchet
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With Double Ratchet every crank movement, forward and back, causes the drill to cut continuously—Fine for cramped corners. Measures only 10½ in., weighs 1¼ lbs. Handle detachable with magazine for drill points. Purchase points as needed. Three-jaw chuck, —capacity of $\frac{3}{16}$ in. Made with wonderful skill and accuracy as are all—

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Make Better Mechanics

"Yankee" Ratchet Hand Drill

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Your Dealer Can Supply You

Write for "'Yankee' Tool Book" for mechanics and householders; or "'Yankee' Tools in the Garage" for the motorist.

NORTH BROS. MFG. CO., PHILADELPHIA

FIELD NOTES.

(*Continued from p. XIV.*)

keep a record of their tenants. A friendly rivalry is promised in the construction of the bird houses and in reporting on the first nestings.

Miss Anne Davis, director of Chicago's vocational bureau, was the chief speaker at the mid-winter conference dinner of the Child Welfare League of Peoria, Ill. In a forty minute address she gave the hundred members present a more complete idea of the purpose and internal workings of a vocational guidance bureau than they could have gained in many hours of reading.

Persons desiring appointment as teachers of freehand drawing in the high schools of New York City will be interested in the announcement that the next examinations for such positions will be held on September 18 and 19, 1916. A complete circular of information will be sent upon request to the board of education.

An industrial survey with reference to vocational training in the public schools has been provided for by the board of estimate of New York City with the recommendation for an appropriation of $15,000. The board of education made the request, at the suggestion of a recent conference of organized labor on vocational training.

In order that the students in the Boys' Trade School at Worcester, Mass., may have practical experience in machine shop, the Lodge & Shipley Machine Tool Co. of Cincinnati, have offered to employ students from the school if they were sent on. In this way they would enjoy the same opportunity as the students in the University of Cincinnati.

Out of a total appropriation of $500,000 for the benefit of rural schools, the Texas State Board of Education has apportioned $459,000 during the present school year. At the February meeting of the Board the appropriation of $50,000 for industrial aid to high schools was exhausted by the apportionments made at that meeting.

(*Continued on p. XX.*)

A rough-hewn bench, a hammer and a box of nails do not constitute Manual Training Furniture any more than Kipling's "a rag, a bone and a hank of hair" represents a real woman.



This bench is admirably fitted for sectional equipment.

Educational ideals have advanced; educational quarters have greatly improved—educational equipment must keep pace. We are a long way from the three R's and the little red school house.

Kewaunee Manual Training Furniture

BUILT TO EDUCATE

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"OLIVER"
HIGH GRADE WOOD WORKING MACHINES

BEFORE YOU DECIDE on your MANUAL TRAINING EQUIPMENT, make sure you have selected tools that are worthy of a place in your school.

"OLIVER" TOOLS are QUALITY TOOLS

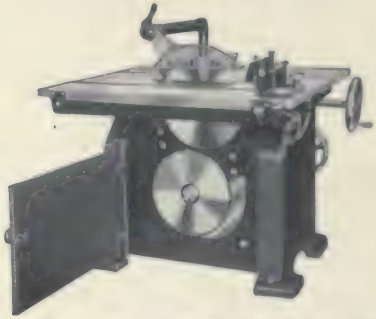
Send us a list of your requirements NOW.

Everything for the Manual Training and Forge Shop.

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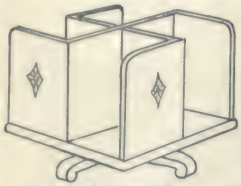
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QUALITY FIRST



When you buy this machine you are not getting poor workmanship or skimped construction. You are getting the very best value that is made in this type of machine and we will gladly prove it to you by shipping one on 30 days' trial.

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OREGON

AGRICULTURAL COLLEGE SUMMER SCHOOL
Corvallis, Oregon---June 12 to July 21

Eastern and Middle Western teachers can "See America First" and attend high grade summer school. Vocational courses in industrial arts under faculty of professionally trained instructors, with practical trade experience. Illustrated bulletin, giving description of courses, buildings and equipment, personnel of faculty and other information, sent on request.

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OTHER COURSES FOR TEACHERS

UNIVERSITY OF WISCONSIN
SUMMER SESSION, 1916

ALL BRANCHES OF THE MANUAL ARTS AND HOME ECONOMICS FOR HIGH SCHOOL TEACHERS AND PUBLIC SCHOOL SUPERVISORS

FEATURES:

Two Courses in Elementary School Construction Work and Drawing.
Three Courses in Mechanical Drawing.
Three Courses in Architectural Drawing.
Three Courses in Freehand Drawing and Design.
Three Courses in Craftwork.
Ten Courses in Industrial Shopwork.
Engineering Courses Adapted for Manual Arts Instructors: Machine Design, Gas Engines, Sanitation.
Courses in Teaching and Supervision and in Vocational Education and Guidance.
A Seminary Course in Manual Arts and Industrial Education.

The University offers 346 courses for those who wish to do regular graduate or undergraduate work for credit toward degrees in Letters and Science (including Medicine), Engineering, Law and Agriculture (including Home Economics.)

6 WEEKS June 26 to August 4 — **LAW, 10 WEEKS** June 26 to September 1

One fee for all courses $15.00, excepting Law, $25.00.

Write for Illustrated Summer Session Bulletin.

REGISTRAR,
UNIVERSITY, MADISON, WIS.

FIELD NOTES.

(*Continued from p. XX.*)

The high school at West Palm Beach, Florida, is said to have the best equipped manual arts department in the state, although it is a town of only 5,000 population. They have a bench woodworking room 50 ft. by 24 ft.; a machine woodworking room 50 ft. by 24 ft.; a drawing room 40 ft. by 24 ft.; a finishing room 6 ft. by 8 ft. The equipment is of the best and is planned for classes of eighteen. The students made the tables in the drawing room. Work is given in the seventh and eighth grade and in the high school. Tasso T. Lindsey is supervisor of the work.

Miss Grace Stuber, formerly instructor of arts in the schools of White Haven, Pa., was recently elected a teacher of arts in the public schools of Reading. Dr. Charles S. Foos, superintendent of schools of Reading, is increasing his force of art teachers in order to raise the standard of freehand drawing in the lower grades.

George Barbey, who has been for the past four years director of industrial education in the public schools of Williamsport, Pa., has just been elected director of practical arts in the public schools of Reading, Pa., to fill the vacancy made by the appointment of Wallace E. Hackett to the Pennsylvania Department of Public Instruction.

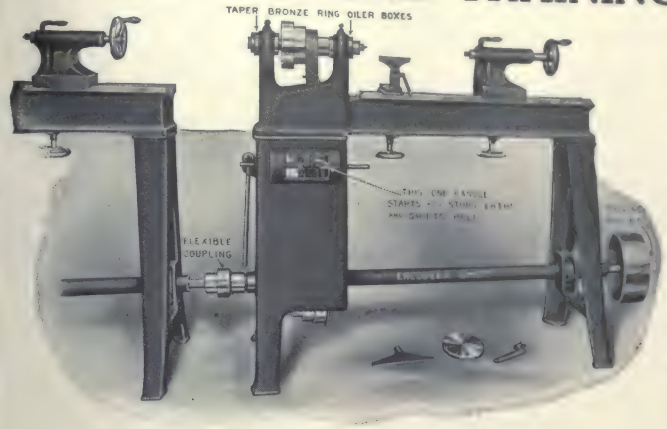
The Northwestern Arts Association of Pennsylvania will hold its spring meeting at Ridgeway on April 15th. Roy C. Diver of Erie, Miss Mary Flinn and Miss Catherine Signor both of Ridgeway, are in charge of the arrangements.

The Northwestern Arts Association of Pennsylvania will hold its annual spring meeting at the Scranton Technical High School on May 13th. William H. Scranton, its president, and the members of the local committee are making elaborate preparations for the entertainment of the members.

Earl L. Poole, formerly instructor of drawing in the high school for boys in Reading, Penna., has been promoted to supervisor of drawing in the Reading schools.

(*Continued on p. XXII.*)

WELLS MANUAL TRAINING LATHES



WELLS Shaft Underdrive Lathe with Single Handle Control

SAFETY AND SIMPLICITY—

That is what all supervisors and instructors want and must have in a Manual Training Lathe.

THE NEW "WELLS" LATHE with the SINGLE HANDLE CONTROL

has no equal in those and other essential features. We welcome investigation and comparison.

ONE HANDLE does it all—Starts the Lathe—Stops it—Changes the Speed. (4 changes). Could anything be simpler?

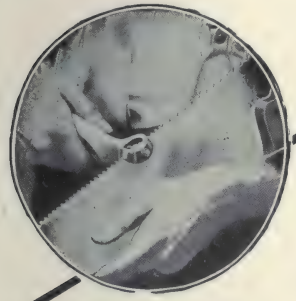
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Single Handle Control on both Shaft Underdrive and Motor Underdrive Lathes.

Demonstrator's Lathes with either Outside Face Plate, Tripod and Tee Rest or Hand Feed Carriage or both.

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A booklet on how to sharpen and properly set Saws of all kinds. There is one *right* way to do this. Why not know how by reading this booklet. Write for FREE BOOKLET containing information valuable to all students.



Chas. Morrill

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WE HAVE QUITE A COMPLETE LINE OF

SAW TABLES

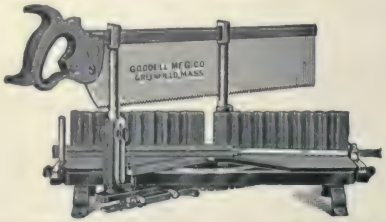


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Save repair expense.
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GOODELL MFG. CO., Greenfield, Mass.

"AT YOUR SERVICE"

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Mrs. Gertrude P. Ashley,
P. O. Box 142 Deerfield, Mass.

FIELD NOTES.

(*Continued from p. XX.*)

T. W. Bennett and his associate teachers in the manual arts department of the schools of Bellefonte, Pa., are completing plans for the Spring Conference of the Mountain Arts Association, which will be held in that city on May 5th and 6th.

The latest vocational opportunity that is being urged upon school authorities is vocational courses for hotel cooks. It has been pointed out that courses in kitchen hygiene and chemistry of food if given in evening schools or continuation schools, would result in an added appreciation of the dignity of this kind of work, and a consequent better service.

The boys in the Technical High School, Syracuse, N. Y., are making 40 tables for use in the lunch room of the new Vocational High School. When this work is completed the students will make 18 benches as foundations for turning lathes.

When the Brooklyn Vocational School for Boys began the new term the first of February, they were obliged to refuse admission to 200 boys on account of lack of room, although the school was opened only last June.

The Cleveland School of Education announces its summer courses from June 19 to July 28. The courses in industrial education are under the direction of R. W. Himelick and William E. Roberts.

The school district of Mt. Pleasant Township, Pennsylvania, has opened evening classes for mine workers.

Shop work for boys has been introduced into the schools of Boyertown, Pa.

C. C. Peters, superintendent of schools at Royersford, Pa., has had installed in the high school equipment for cooking for the girls.

At the regular meeting of the Cleveland Manual Training Club, held March 25, W. R. McCornack, architect for the Cleveland board of education, was the speaker.

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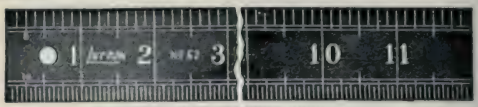
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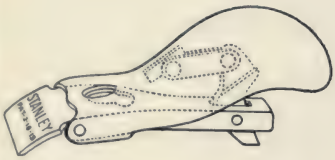
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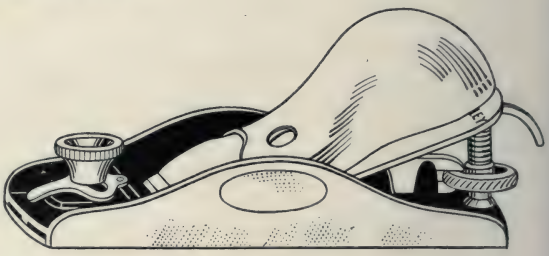
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The small cut at the left shows in detail the construction of this new style lever.

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THOMAS NORMAL TRAINING SCHOOL

TRADE NOTES.

The recent meeting of the Illinois Manual Arts Association at Joliet was attended by a larger number of exhibitors than usual. Among the most attractive exhibits were those of The Stanley Rule & Level Company represented by E. A. Cherry, and Henry Disston & Son represented by Ernest C. Schiele. Other exhibitors were Millers Falls Company, The Frederick Post Company, Graham Paper Company, The Prang Company, Everett Frain Company, The Bridgeport Wood Finishing Company, W. A. Ives Mfg. Company, American Woodworking Machinery Company, American Type Founders Company, E. C. Atkins & Co., Thomas Charles Company, and S. C. Johnson & Son.

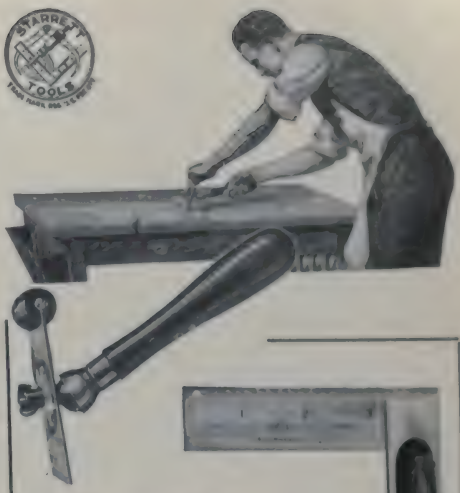
A Demonstration Saw was displayed at the exhibit of E. C. Atkins & Co. As its name implies, this saw is ground to show the different kinds of teeth. One-half of the cutting edge is devoted to cut off teeth and one-half to rip teeth. The cut off teeth are 7 pt., 9 pt. and 11 pt. showing properly filed, uneven filed, filed straight across and to the wrong bevel. Rip teeth are 5 pt., 6 pt., and 8 pt., showing correct set, over set at points, and no set. Each section of teeth is labeled so that it can conveniently be used for illustrating the various teeth as well as proper filing and setting. It will be loaned by the company to manual training instructors or sold at the nominal price of $2.00.

Henry Disston & Sons showed their No. 200 Hacksaw Frame, a new tool recently brought out by them. The feature of this frame is the small distance from the cutting edge of the blade to the back of the frame which measures only one inch. It is small, convenient, and strong, and for many kinds of work is better and more convenient than the ordinary frame. This new tool was shown along with an attractive display of their well known tools.

Teachers interested in securing samples of various woods will do well to get in touch with Everett Frain Company of Chicago. Mr. Frain displayed samples of 24 of the woods common to manual training shops. The samples are 4″ x 6″ x $\frac{13}{16}$″ thick, are surfaced and sanded and sell for $3.00

The Frederick Post Company displayed a full line of drawing instruments, tools, materials, and supplies, including their new "Verdangle,"

(*Continued on p. XXVI.*)



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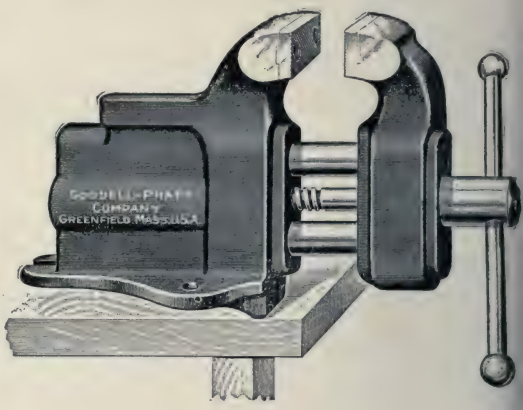
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HANOVER, PA.

Oliver Machinery Co., Ltd., Manchester, England, sole agents for Great Britain.

TRADE NOTES.

(*Continued from p. XXV.*)

"Curverds" and "Vordoid" lined T squares. The green composition which characterizes these tools is extremely hard and transparent and does not cast a shadow. It offers a perfect ruling edge and greatly reduces eye-strain. J. R. Franklin was in charge.



The No. 370 Bench Vise shown above, manufactured by the Goodell-Pratt Co., Greenfield, Mass., was put on the market for school use after it had been thoroly tried out in their factory for many years. This fact is of special interest since it is well known that school equipment often receives hard usage at the hands of careless students. This vise has two 1⅛" steel rods as well as a large steel feed screen, which give it great rigidity. The thread-cut on the feed screw is of special form designed to give added strength. The jaws are heavy and the jaw faces are made of tough steel carefully hardened. These steel jaws are held in place by taper headed screws, thus making it possible to tighten up in course of wear.

Another tool that has been built to withstand the hard usage of the school shop is the Steel Mitre Box, manufactured by the Goodell Manufacturing Co., Greenfield, Mass. The parts are all made of steel and cannot break or get out of order. The constantly increasing sales to schools prove the worth of this tool. A complete descriptive circular will be sent upon request.

(*Continued on p. XXVIII.*)

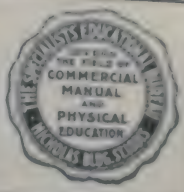


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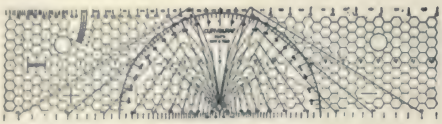
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TRADE NOTES.

(*Continued from p. XXVI.*)

We welcome the Greenlee Bros. & Co., Rockford, Ill., to our advertising columns. For nearly half a century this firm has been making a heavy type of woodworking machinery which has become standard in their line. They are now manufacturing a line of lighter machines and tools to meet the school needs. This new line embodies the same ideals of good workmanship that have always characterized their products. Among their school machines and tools are mortisers, tenoners, variety saws, universal saws, jointers, borers, bench vises, auger-bits, carpenters' chisels, and wood turning tools. Trade and industrial schools in which strong courses in furniture and cabinet making are given will be interested in their sectional catalog C which covers this special equipment.

The Oliver Machinery Co., Grand Rapids, Mich., has recently issued a very beautifully illustrated catalog entitled "Woodworking Machinery of Quality." This firm has long been known as manufacturers of this line of machinery, and anyone not fully acquainted with their goods would do well to send for their catalog. We have recently received a special circular describing their No. 14 "Oliver" Hand Planer and Jointer, which is made in five widths, namely 12, 16, 20, 24 and 30 inches.

The curvograph, manufactured by John W. Whalen, Graymont, Illinois, is an ingenious device for finding the centers for any curve which is made up of arcs of circles. Its invention is another example of the old proverb "Necessity is the mother of invention." When Mr. Whalen was a student in elementary mechanical drawing he ran up against the usual difficulties in finding the centers of the arcs he wished to draw. He began to experiment, and the invention of the curvograph was the result. It saves time and trouble, is easy to use, practical and durable.

At a time when the various industries are of so much interest to school people, the announcement of the Corticelli Silk Mills, Florence, Mass., will appeal especially to domestic art teachers. They are issuing a little booklet entitled "Silk, Its Origin, Culture and Manufacture," which sells in paper cover for 10 cents; cloth cover, 24

(*Continued on p. XXX.*)

BIRD HOUSES
BOYS CAN BUILD

By ALBERT F. SIEPERT
Bradley Polytechnic Institute, Peoria, Illinois

A BOOK of rare interest to boys who are lovers of nature, the out-of-doors, and especially "our feathered friends", the birds. It illustrates hundreds of bird houses and shows working drawings of houses of various designs, some formal, some rustic, and some of cement. Bird houses, feeders, shelters, sparrow traps, and other bird accessories, are also illustrated by photographs and drawings. The common house-nesting birds such as wrens, house finches, bluebirds, martins and others are pictured and described, together with information regarding foods, houses and shelters suitable for each. Excellent illustrations give a good idea of the character and size of successful bird house exhibitions which have been conducted in several cities. It is written in the boy spirit and combines the charm of nature with the allurements of continuation work in wood.



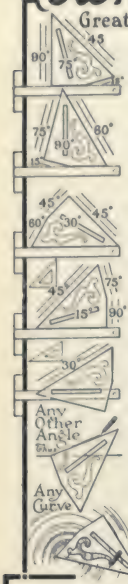
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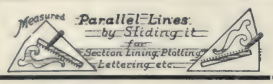
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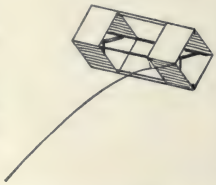
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TRADE NOTES.

(*Continued from p. XXVIII.*)

cents. The special offer in connection with their silk culture cabinet is also of interest. Particulars will be sent upon request.

In the February number of *The Disston Crucible,* "a magazine for millmen," published by Henry Disston & Sons of Philadelphia, is an excellent article on "White Pine." This article contains just the kind of information that teachers need in preparing talks for their classes. The price of the magazine is 10c a copy.



The Stanley Rule & Level Co. are showing a new spoke-shave which should make a strong appeal to manual arts teachers. The distinctive and important feature is the method of adjustment. This can be done quickly and accurately both endwise and sidewise by means of the two adjusting screws which engage the slots near the top of the cutter. The lever cap fastens the cutter in such a manner as to bring an even pressure on the cutting edge. It is made with either raised or straight handles. The accompanying illustration makes clear the foregoing points.

Our readers who work in the various crafts often find themselves in need of finishing supplies such as snap fasteners for leather pocket books and similar articles. If they would send for the complete catalog issued by the Thos. K. Lewis Co., 204 E. Tompkins St., Columbus, Ohio, it

(*Continued on p. XXXII.*)

WANTED—In large Eastern college, three instructors to combine teaching of shop work with practice of applied principles of scientific management. One to teach wood work, one to teach forging and one to teach partly in machine shop, and partly on thesis and factory lay-out work. Applicants must be graduates of an engineering college, willing to adapt themselves to prescribed methods and begin at as low a starting salary as $1000 to $1100.

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INTRODUCTION

CHAPTER I. Design Based on Selection and Arrangement.
- Abstract Areas Well Selected and Arranged.
- Underlay Figures as Used in Constructing Dress Designs.

CHAPTER II. Dress and its Relation to the Wearer.
- Dominant Lines of the Costume Should be Adapted to Dominant Lines of the Figure.
- Lines Echoing Length Lines are Especially Good for the Stout Figure.
- Horizontal Lines and Divisions Tend to Modify an Over Slender Figure.
- Every Costume Should Have Unity Either of Line or Color.
- Belts and Tie Ends.

CHAPTER III. Principles of Design Applied to Hair Dressing.

CHAPTER IV. Principles of Design Applied to Millinery. Relation of Trimming to Structure of Hat.

CHAPTER V. Color.
- Theory of Color.
- Color Harmonies.
- Use of Color.
- Color Schemes.
- Areas.
- Outline for Use in Designing a Dress.

CHAPTER VI. Principles of Design Applied to Embroidery.
- Relation Between Decoration and Object Decorated.
- Selection.
- Arrangement of Designs for Sofa Pillows.
- The Use of Color in Embroidery.
- Outline for Use in Working Out Embroidery Designs.

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- Class Exercise.

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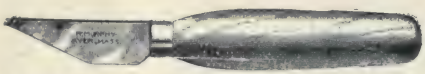
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TRADE NOTES.

(Continued from p. XXX.)

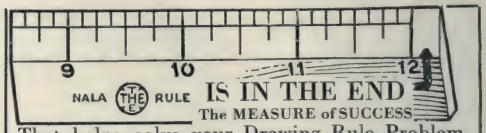
would prove a friend in time of need. It lists and describes the supplies and equipment for all the various crafts.

Hall & Brown Wood Working Machine Co., St. Louis, Mo., are among the number who have just issued a new catalog illustrating their latest improved machines for school use. It is beautifully printed and illustrated, and well bound. Indeed, catalog makers are coming more and more to appreciate the value of the appearance of their "silent salesmen."

Eugene Dietzgen Co., Chicago, Ill., are desirous of bringing their "Excello" Drawing Pencils to the attention of teachers. Absolute uniformity of lead is assured users of this pencil and it is made in 9 degrees of hardness, accurately graded.

Schools planning to install a print shop equipment would find "Printing a Natural Part of Every School Course" and "Printing Outfits for Schools—Some Estimates of their Cost" very interesting reading. These two circulars can be secured from Barnhart Brothers & Spindler, Chicago, Ill.

In our last issue an error appeared in giving the capacity of the 4A bench type of "Fox" Wood Trimmer. It should have read: 4 in. high and 7¾ in. wide.



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A small-size textbook and note-book combined. It furnishes a few general and extremely important directions about tools and processes; and provides space for additional notes and working drawings of exercises and articles which the pupil is to construct. It is essentially a collection of helps, ideas, hints, suggestions, questions, facts, illustrations, etc., which have been prepared by a practical teacher to meet a real need in his own shop. The notebook is full of suggestions; shows a keen insight into subject matter and teaching methods and is an effective teaching tool. Price, 15 cents.

PROBLEMS IN MECHANICAL DRAWING. By Chas. A. Bennett.

A students' textbook consisting of 80 plates, classified into groups according to principle and arranged according to difficulty of solution. It furnishes teachers of classes beginning mechanical drawing with a large number of simple, practical problems which have been selected with reference to the formation of good habits in technique, the interest of the pupils and the subjects generally included in a grammar and first-year high school course. Each problem is given unsolved and therefore in proper form to hand to the pupil for solution. New edition. Price, 75 cents.

WOOD PATTERN-MAKING. By Horace T. Purfield.

A clear, concise treatise on the fundamental principles of pattern-making. It presents the best methods of construction and those most easily understood by the student. It is not arranged about a course of problems but may be used with any course. A practical text for high school, trade school, technical school and engineering college students. Written by an experienced pattern-maker and teacher of pattern-making and kindred subjects. New edition. Price, $1.00.

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BOOK NOTES

Art in Dress by Lydia Bolmar and Kathleen McNutt is just coming from the press. It is a pioneer book in a field where there is great need of systematic instruction. It is believed that it will be of great assistance to teachers of sewing and dressmaking, but especially to students in high schools and normal schools who will use it as a textbook. A feature of the book is the group of large sized drawings of figures to be dressed. These are triple sheets bound into the book. They may be taken out and used in drawing designs of costumes, or from these, tracings may be made to use in working out problems. This feature is going to show many teachers how they can successfully give instruction in the designing of underwear, dresses, aprons and all the elements of costume to classes in high schools. The fact that the book costs only 35 cents ought to insure its very general use.

THE BIRD HOUSE BOOK.

The very general interest in the making of bird houses has led Professor Albert F. Siepert of Bradley Institute to collect material from many sources and prepare an inexpensive booklet which is being published by The Manual Arts Press. Its title is *Bird Houses Boys Can Build.* It will be ready for distribution about the first of April. The book combines the charm of nature study, with the allurements of construction work in wood. It is written in the boy spirit, but with the educational purpose clearly in mind. It is a fine example of the possible correlation of science and manual training.

From Massachusetts, Vermont, Maryland, Pennsylvania, Minnesota, Wisconsin and Illinois have come the problems that are included in this little book, and they are practical. The National Association of Audubon Societies has contributed photographs for some of the illustrations of birds. The *Youth's Companion* has permitted some of its illustrations of feeding shelves to be reproduced. The Bulletins of the Department of Agriculture have been drawn upon for scientific facts, and for some of the illustrations. In all, there are 67 illustrations in the book, about one-third of which are working drawings. Several of these have appeared in the Shop Notes and Problems Department of this Magazine. In fact, the material which has appeared in this department furnished the basis for the book.

The first chapter speaks of some of the characteristics of birds that live in nesting boxes —the bluebird, robin, chickadee, wren, house finch, woodpecker, and martin. The second deals with the construction of bird houses. It gives the different types and the important dimensions. The placing of the houses is treated in the third chapter, feeding shelves and shelters in the fourth, and bird baths in the fifth. The sixth speaks briefly of bird enemies, and the seventh gives some information concerning bird house exhibitions.

Such a collection of practical suggestions can hardly fail to appeal to any wide-awake boy and to his teacher who is looking for problems to stimulate him to his best effort in shopwork.

We continue to receive appreciative letters concerning *Problems in Farm Woodwork.* Here is one written by a teacher in New England:

"I have examined Blackburn's *Problems in Farm Woodwork* with peculiar interest and pleasure. It so happens that for several years past I have felt the urgent need for a book of this character in connection with my work of training teachers of manual arts for rural schools; and have collected some fifty or sixty problems, to which your new list makes a welcome addition.

"It is interesting to know that, like the author, I, too, have found the helpful suggestions and experiences of my students a fruitful source of raw material; and that my list, compiled independently, and for another section of the country, contains twenty-four problems found in the book.

"I wish especially to commend the form in which Mr. Blackburn's work appears. The drawings are clear and adequate; while the adjacent page of descriptive text, including description and directions, is convenient for use and comparison with the plate.

"I have already recommended this book to my students, and shall order a copy for our manual arts library at school. It should be a welcome aid to handwork teachers particularly in agricultural districts of the middle west."

DRAFTING ROOM PRACTICE IN PRACTICAL TEXTBOOK FORM

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MECHANICAL DRAFTING

By H. W. MILLER

and Department of General Engineering Drawing
of the University of Illinois

A Practical Drawing Room Text Which Can Be Used With Any Course of Problems

This book will be welcomed by teachers who are trying to make their work practical and to conform with commercial drafting room practice. It is free from the common teaching room conventionalities and instead, presents only actual drafting room practice. It strikes out boldly by giving information which the draftsman must know and eliminates a large amount of material usually presented in books on this subject and for which the commercial draftsman has no need. It shows a keen insight into subject-matter, commercial conditions, teaching methods and the needs of the student and the beginning draftsman. It is not only a successful textbook but is also a valuable drafting room hand-book. It is simple; condensed, yet complete; well illustrated, and is bound in flexible leather, pocket size. The following is a brief table of contents:

TABLE OF CONTENTS

Lettering; Freehand and Mechanical. Equipment; Formation of Letters; Spacing; Titles.

Use of Instruments. Drawing-Board; Paper, Border Lines; T-Square; Scale; Needle Point; Triangles; Pencils; Erasers; Cleaning Pads and Blotters; Drawing Instruments; Ink Bottles; Protractor.

Orthographic Projection. Principles of Orthographic Projection; Permissible Violations; Auxiliary Planes of Projection; Third and Fourth Views of a Working Drawing.

Working Drawings. Detail and Assembly Drawing; Detail Working Drawings; Order of Pencil Work; Dimensioning; Sectioning; Tracing.

Fasteners. Threads; Conventional Representation of Threads.

Shop Terms, Tools, Machines. Draftsman's Use of Shop Terms; Finish; Drill; Bore; Ream; etc.

Isometric and Oblique Projection. Principles; Isometric Scale; Irregular Objects; Oblique Projection; Axes and Co-ordinate Planes; Dimensioning; Oblique Scale; Circles; Irregular Objects; Shades and Shadows; Principles.

Machine Sketching. Paper; Nature of Drawing; Pencil-Sketch Stroke; Size of Drawing; Procedure; Short Cuts.

Perspective. Perspective Drawing; Principles of Construction; Picture Plane and Position of Object; Position of Point of Sight; Principal Point in Perspective; The Horizon in Perspective; Mechanical Construction of a Perspective, etc.

Appendix. Photographic Reproductions; Blueprinting; Engraving Processes; Half Tones; Abbreviations Used in Drafting; Reference Tables; Conventional Standard Symbols Used by Architects and in Electrical and Automobile Construction, in Hydrographical and Topographical Drafting and Structural Drafting, Patent Office Drafting, etc. Bolts and Nuts; Screws; Pipe Threads; Shop Operations; Keys and Keyways.

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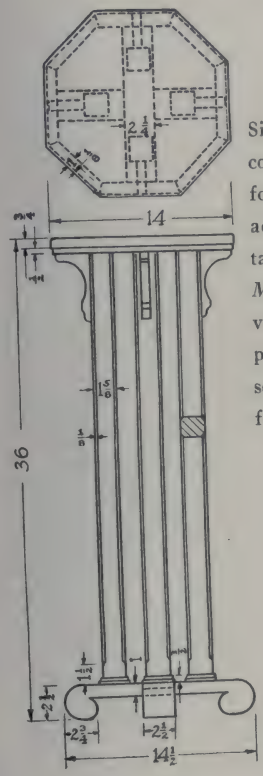
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JUST PUBLISHED

SHOP PROBLEMS SERIES No. 2

On Tracing Paper Ready for Blue Printing



This is the second series of Shop Problems by Albert F. Siepert. It is uniform in size and style with Series No. 1 yet contains an entirely different set of drawings. It is a portfolio of drawings of projects printed on tracing paper and adapted to be blue printed for students' use. The plates are taken from the "Shop Notes and Problems" department of *Manual Training and Vocational Education* of the present volume. Among the distinctly new projects shown are three pieces of playground apparatus which can be made by high school boys for school playground use. The list includes the following:

MILK BOTTLE HOLDER
WASTE BASKET
PLANT STAND
OPEN BOOK SHELVES
MAGAZINE RACK
MUSIC CABINET
HALL SETTEE
OFFICE DESK
MANUAL TRAINING BENCH
DRAWING TABLE
DRAWING TABLE
DRAWING TABLE FRAME DETAILS
WREN HOUSE
CONCRETE FORM
PLAYGROUND SWINGS
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PLAYGROUND SLIDE

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In ordering be careful to specify which series is wanted

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THE MANUAL ARTS PRESS, PEORIA, ILLINOIS

AFTER HOURS

MY great uncle was a seventh son of a seventh son, but my particular twig of the family tree was comparatively short on sons. I am therefore not a seer by birth. However, one does not have to be "born so" to see some things in these days. If he keeps at all alive as a teacher of manual arts he cannot very well escape the impression that something momentous is happening, and if he has a view beyond his own state he must surely realize that one of the greatest outcomes of teaching handwork in the school is going to be in the direction of art development. And he is forced to ask himself the question, Who has the best chance to teach art to the children of the nation, the teacher of representation or the teacher of construction?

There are many indications that the American people are bound to have more art in their lives. This means more art in the homes of the people, in the things they wear, in the things they make, in the things they enjoy; and more art in things means more design in things, better taste, and this, in turn, means more teaching of design in the schools. This teaching, if in harmony with our present pedagogy, means more handwork in the schools—handwork involving design, art. The drawing teachers must become manual training teachers in order to be art teachers, and the manual training teachers must become design teachers in order to be able to teach art.

A NEW ART CREED.

"I WONDER if you have read the new art creed of Miss Bonnie E. Snow, head of the Normal Art Department of the New York School of Fine and Applied Art, published by the Prang Company in a brochure entitled *A New Note*. Here it is; and as you read it see if you don't have a feeling that it ought to be your creed too? Wouldn't you like to help along the day Ruskin and Morris dreamed about, which now seems almost here?

"I believe in the Democracy of Art. I believe in Art for the people, of the people and by the people. I believe that no art is so fine as to be unfit for daily use. I believe that the principles of Art can be intelligently presented to the understanding of the ordinary individual so that he may see their application to the affairs of his occupation, his business, his profession and his home. I believe that Art is soon to be shorn of its mystery and its vagueness and that it is about to take its place as a teachable and demonstrable science, possessing a quality that is inherently divine. I believe that public schools offer the best opportunity for bringing the influence of Art into the lives of all the people. I believe that public school teachers are, or will become, the best possible teachers of Art to the school children. I believe that we must apply to the teaching of Art the same pedagogical intelligence, the same common sense, the same preparation and the same tests that are applied to the studies of language, mathematics and the sciences. I believe that the results from the teaching of Art should be definite and tangible; that the cultivated emotions and the trained intellect should find expression in those inevitable selections of form, proportion and color which tend to make our material environment more beautiful. I believe that beauty is coming back to the useful arts and that the distinction between fine Art and useful Art is to be forgotten."

In another place the same author has said, "I am perplexed with many problems but through my confused and anxious vision I see a dawning light. I hear a new note—the herald of a welcome change. As I work in the light, I shall see increasing light. Others are working with me. They, too, have heard the note, the call to wiser effort and a surer end. I believe in the service of Art. I know that all Art has relation to life, and I am convinced that the life of Art is to be found in service."

A GOOD CONUNDRUM.

HERE is something worth thinking about, and incidentally it is a good word for the director of industrial education in Pittsburgh. It comes from an editorial writer in one of the large magazines:

"Why are teachers in these industrial schools crazy from enthusiasm?

The pupils have enthusiasm in their work. Do the teachers get it from them or they from the teachers? In the two Pittsburgh Vocation Schools those who don't radiate enthusiasm, scintillate it, and enthusiasm is the world's most powerful motor and promoter."

VOLUME XVII NUMBER 9

MANUAL TRAINING AND VOCATIONAL EDUCATION

MAY, 1916.

PRACTICAL EDUCATION—TOMORROW'S DEMAND.

LEON WISLAR SCOTT.

WE have but to hearken to the discourse of those conversant with educational affairs of today, to learn that there is a great diversity of opinion as to the efficiency of our schools. They have been praised and lauded to a very high degree by some, and very severely criticised by others. In fact the condemnation far over balances the commendation. All about us we hear and see derogatory expressions regarding our schools and their methods, depicting their retrogression.

OUR SCHOOLS CONDEMNED.

Our school system is the result of a very gradual growth. Its content and methods have been gathered little by little thru the ages. The result is that these methods and this content are in a large proportion antiquated. It is because of their antiquated methods that they are so frequently condemned. Generally speaking, our educators look to the curriculum as a knowledge-giving instrument. They do not stop to consider the worth of the knowledge to the individual from a practical standpoint.

The adverse and valuable criticism comes most frequently from those outside the school, in the commercial, industrial and technical world. These men have been thru the mill. They see the shortcomings of the system which gave them their education, and note the same short comings in those who are sent to be their employes. They assert that they are compelled to abide by the failure of the schools to prepare the individual for life's essential and practical tasks. Furthermore, they claim that the old time emphasis on the three R's has been lost, and music, art, literature, physical culture, domestic science, etc., have en-

tirely supplanted the subjects in the curriculum which were designed to give the individual a thoro foundation for a common-sense education.

Those in the business and technical world contend that the product of our public schools is raw and unprepared to cope with the practical problems in these spheres. Recently I had the opportunity of talking with a man of importance in the technical world. He said that he would be well satisfied, if, upon receiving a graduate of the elementary schools, he could be definitely assured that the graduate understood thoroly, such things as the foot rule, weights and measures, fractions in their simplest form, spelling, and other simple but vital things. Such training combined with the ability to think—not mere mimicry of the thoughts of others—well supplemented by a little ordinary horse sense, would make a truly valuable individual.

This man struck the key note to the whole situation:

First. The failure of our schools to teach practical and utilizable knowledge. If it were not for the knowledge casually gleaned outside the school, by the individual, he would oft times be utterly helpless when brought face to face with practical problems. The individual in the school is not brought in contact enough with the real doing of things. It would be ridiculous to expect a man to become a surgeon by merely reading of the feats of others in his profession. To the theory he must add the ability to execute these feats himself. He cannot learn to remove the appendix or trephine the skull without practicing the actual operation upon a human being—first on a dead body, and then upon the living being under the careful direction of a skilled surgeon, until proficiency is obtained. Comenius said, "We must learn to do by doing." This valuable suggestion is usually ignored in our schools.

Second. Our schools aim to cram the individual with thoughts and theories of others, to the utter disregard of inspiring initiative and original thought.

Man is a natural born parrot. Mimicry is his first accomplishment; when in infancy's state he mimics the actions of those about him. Our schools need to curb this tendency, not foster it.

The power to think clearly and concisely is man's most valuable asset. What are our schools doing to cultivate this faculty? Those who employ the graduates of our public schools agree that the result is practically nil.

From my observation there is about one real thinker in every fifty individuals graduated from our higher schools. Is this the fault of the

individual? No. Is it the fault of the parents? Occasionally. However, the chief fault lies in our schools.

Let us profit by this adverse criticism. Our schools must continue to be the bulwark of our nation's greatness and the keystone of civilization. Thru the school of the future let us endeavor to produce more thinking men, a greater nation, and a higher civilization.

EDUCATION—DEMOCRACY'S PREROGATIVE.

Every individual in this land of the free has the right to demand an education that will best fit him for the life he is called upon to live. Such an education is purely a democratic one and in this great country of ours no other education will suffice. If any individual be denied this undisputed prerogative, of being *properly educated*, sooner or later disaster will fall upon us, and the very depths of the foundation of our nation will be shaken.

Our children are being denied this natural birth-right of being properly educated, in hundreds and thousands of instances. Our prisons, reformatories, truant schools, and the ranks of unskilled labor are glutted with individuals whose lives have been crippled and distorted for lack of education fitted to their specific individualities. We must heed the cry of these unfortunates and adapt our curriculum, not to the needs of the few, but to the needs of the many. This is not supposed to be a land of caste and class. It was intended to be and must be the land of and for the common people. Therefore our educational institutions must meet the requirements of the common people. There should be no such thing as the thought of the *elite* in the formation of the curriculum. It should be designed and operated for the people *en masse*.

Our school system from its very beginning has been planned for the minority rather than the majority. Our educators have labored to perfect the superstructure of higher education, to the neglect of the foundation of all education, elementary training, and the result is a veritable house upon the sands. We have erected a titanic educational system upon a very unstable fuondation—our elementary school. The supreme purpose of the elementary school is to prepare the individual for high school, and indeed this is about the only specific thing it accomplishes. Out of every fourteen pupils entering the elementary school, only one enters high school, yet all emphasis is placed upon the high school curriculum. We are spending eight times as much on each pupil in the high school as we spend per capita in the common school grades. Ap-

proximately one-half of one per cent of those entering our school ever seek admission to our colleges. However, vast sums are spent upon college education, as compared to the amount expended on our elementary schools. The fact that the elementary school is the foundation of all higher education can not be disclaimed, and the component parts of a foundation must always be carefully guarded. Seven out of every hundred of our school children enter high school and less than one in a hundred matriculates in college. One can readily see from this recapitulation, that the education of democracy is the education which the grades *should* offer. This great mass of individuals must learn all that schooling can ever afford them in this early period of adolescence. It is decidedly imperative, then. that we at least construct the curriculum of the grades to meet the requirements of this large majority.

Educators are just awakening from a state of lethargy, to the realization of the truth of this condition. A few decades hence our present curriculum will scarcely be recognizable as ever having been the instrument of our schools. The reconstruction of our entire educational system is at hand; but in its infancy. All hail the dawn of the day of its ultimate completion! The demand of our democracy is not only for a democratization of the curriculum in the grades; but also for a high school curriculum designed to meet the needs of the masses discontinuing schooling at this period, and for a free college education for all who wish to continue their studies.

THE MAKING OF THE CURRICULUM.

The curriculum is but one of various channels thru which knowledge may be gleaned. It is intended to be the chief instrument of education because it establishes a nucleus for the continuous gathering of knowledge. The other agencies, such as our general experience in every day life, association with our fellows, independent reading and experiment, travel, lectures, the motion pictures, etc., all play an important part in the education of man. The most efficacious curriculum then, is one that will be so constructed as to establish a continunity of method between this supreme instrumentality in the diffusion of knowledge, and the minor agencies encountered in the actual participation in one's life work.

At present there seems to be too wide a gap between the school and the vocation of the individual. Our curriculum does not savor enough of the practical, or of utilizable knowledge. It is too subtile, too theoretical, and fosters too strict an adherence to book lore. Fre-

quently the curriculum becomes a minor agency in the education of man, because of its inadaptability to his need of the practical in his life's pursuits. Let us endeavor to discover just why such a state of affairs should exist.

Those who are responsible for the making of our modern curriculum are too often of the pedestaled professional class. They are too far removed from the common herd to have cognizance of its needs. The educator as a rule does not associate himself enough with those engaged in commercial, technical, and other pursuits. A teacher has an excellent opportunity of becoming a slave to routine, and a very narrow individual, and in most cases he eagerly embraces the opportunity. We do not always find the most broadly read and large minded individuals in the educator's shoes.

In the making of a practical curriculum there must be a general comingling and consultation of the educator and the man who makes a cold business proposition of living. The curriculum-maker has no more right to formulate a curriculum without first carefully weighing the evidence as to the value of the subjects therein than a judge has to convict a man without first hearing the evidence before him. The educator must go for this evidence to the men in the commercial, industrial, technical, agricultural world—to spheres of activity other than his own. Let him even go back to our penal institutions and profit by the evidence and experience of the misfits there who have been inadequately educated. These are the channels thru which it would seem that the successful curriculum-maker must travel.

Our modern curriculum, in a great many instances, is simply a conglomeration of traditional subjects, placed there by our ancestors; and fads and fancies of ultra-modernism, combined with a minimized number of subjects diffusing real utilizable knowledge. There are too many subjects in our schools which are easily taught, but valueless; whilst subjects which teach the actual and practical art of living are conspicuous by their absence.

Every truly educated individual must have knowledge, power and skill. We look to our public school curriculum to diffuse a rich store of knowledge, carefully correlated with the power to use it and put it into practice. The acquisition of skill or exactness and speed in the dispatch of power, will be acquired later, with a still richer store of knowledge thru life's every day experiences.

THE ACADEMICIAN AND THE PRACTICAL EDUCATOR.

Our educators are rapidly dividing themeslves into two separate and distinct classes: First, those who still cling to the medieval curriculum, with its strict adherence to antiquated subject-matter and methods. They have a strong antipathy for the teaching of subjects that might tend to lessen the dignity of the proverbial scholar. These educators are in favor of a curriculum that will prepare all individuals attending school to become scholars in the medieval acceptation of the word. Of course the ultimate total of *scholars* is small. The remainder must fall by the wayside and be content with the unadaptable training they have been accorded. Democracy does not want an education that aims to prepare mere cultured individuals in the medieval sense of the word "cultured." The learned man of medievalism had a vast store of knowledge, an air of professionalism and great dignity. The thought of converting this knowledge into power by practical application of theory was of minor importance to him.

The well educated man of modernism, is the man who not only knows the theory of doing, but has the actual power to do. A man does not want an education that will put a pair of spectacles on the end of his nose and make him the habitue of the dusty library, a store house for unutilizable knowledge and a poor mixer in society. He requires an education that will actually fit him for living and doing successfully. At present he is frequently called upon to live and *do* in spite of his education.

On two different occasions in the last few years, one of our medieval educators, living in the present and at the head of one of our country's oldest and best high schools, has fought the introduction of practical training into the curriculum of said school. One occasion was the introduction of a course for specific commercial training, the other was the introduction of manual training. In each case he was finally overruled by a broad minded board of education. This type of educator, however scholarly, is not best fitted to formulate a curriculum that will adequately prepare the individual to live, think and do.

The second group, the practical educators, are men of broad vision, wide awake to the necessity of living abreast with the times. To this group of men falls the task of rescuing the school from a state of decadence. These educators are advocating a thoro correlation of the school with the business of living. Such departures as manual training, physical training, domestic science, etc., have been the product of their

thought. At present they have under consideration the extension of the trades school, specific vocational training, industrial training, and continuation school work, as well as some radical changes in the method of offering and presenting subjects to the individual. Among them are some radicals who have been called visionaries, but every new departure that has ever resulted in a great achievement has at first been hailed with ridicule and opposition.

The pet theme of the radical is the vast extension of the elective privilege. This offers an education adapted to the individual, as opposed to our present method of adapting the individual to the education. One of our large high schools of the West boasts of offering more than a score of different courses, and even these permit of certain *adapting changes*. Herein lies the type of our future high school. We must offer a greater variety of courses. Every individual needs and has a right to an education adapted to his particular individuality. The traditional group treatment of our children in the schools must cease. A physician in prescribing for a patient, does not stipulate that the patient must take the medicine or die. If he finds the medicine prescribed does not suit the case, he alters the prescription.

The individual in the schools, struggling for a cure from ignorance, should be treated as the physician treats his patient, with medicine that will produce results in the particular case at hand. This is the education that our practical group of educators stand for, and the method that must ultimately prevail.

PRACTICAL EDUCATION IMPERATIVE.

Our schools have done little to make education practical in any sense of the word. The little that has been done has been accomplished in the last three decades. A bold step was taken in the right direction when manual training was introduced. Manual training is not a specific training in any one pursuit or trade, but it offers an opportunity for the student whose mind is befogged with too much theory, to handle things practical and mechanical. Manual training is not a panacea for all educational ills, but it has been a valuable asset to our curriculum as a nucleus for its further practicalization.

The advent of manual training was followed by physical training, specific commercial training, technical training, etc. The natural sequel to all this specific training is vocational training, supplemented by careful supervision by the school over the individual, for a period after

his departure from the school's portals. Thus the school would extend its present jurisdiction, and continue to be the chief instrument for the guidance of its graduates in their early growth and development in life's actual tasks.

The call is insistent and imperative for a complete reconstruction of our present curriculum, and it must be heeded. Times have changed, and the place of the schools in society has changed with them. In times gone by the home life of every child provided much of the discipline in practical work that the school did not afford. Outside chores for the boy and housework for the girl went far toward instilling common sense in the child of a few decades ago. The strange evolution of modern life has robbed the home of these disciplinary tasks. The firewood ready cut is delivered by auto; the cow is milked, the chickens fed, the message delivered, the house cleaned by electricity. The good old fashioned home-made bread has been superceded by the baker's loaf, daily delivered. The absolute training of the child, body, mind and soul, has been thrust upon the school, and it must make good.

The complete abolition of the apprentice system has thrown another colossal task upon the school, with which it has failed to cope. The tremendous concentration of effort in the work-a-day world, the shortening of the working day, the dawn of the five work-days week, the organization of labor and trades unions—placing restrictions upon the training of those seeking admission—the advent of the efficiency expert—followed by a demand for maximum efficiency in every individual—the extreme system of petty specialization in the industries,—all these combined have confronted our schools with the titanic problem of reorganization, to meet their practical needs.

This demand of life's activities is constantly gaining greater impetus, Our school system must stop marking time, and march on in a pace commensurate with the advance of methods outside its immediate sphere. Impractical methods and unadaptable theory inherited from times gone by and retained in our modern curriculum have built up stone by stone the great wall that has separated our school from the world in which we, its product, must live. Now we are called upon to break down this barrier. For its own preservation, the school must in the immediate future, meet this issue squarely, and accomplish a satisfactory and adequate adjustment of its curriculum to the exigencies of modern life.

The growth of a nation, in the scale of civilzation, depends upon its progress in the practical arts and the inculcation of the dignity of labor

and respect for the laborer. Our schools have dealt with this problem inadequately and only of necessity. About ninety-five per cent of their time is spent in diffusing knowledge, and the other five per cent in teaching its real application. This method of education is synonomous with the construction of a mammoth kite without a tail. It will not rise, and neither does the product of our schools in a large percentage of cases. If we would have a practical education, there must be more of an equable effort exerted upon its two chief factors—knowledge and the power to apply knowledge.

The industries, dissatisfied with the lack of cooperation accorded them by the educational authorities, have, in a great many instances, established their own schools. This condition is an unhealthy one, as it is prone to place too much emphasis upon utilitarianism in education, and must not be encouraged.

The paramount issue of the school of tomorrow must not be preparation for college, but practical preparedness of every individual for life.

A MAN EDUCATED IN THE MODERN SENSE WILL FOREGO THE SOMEWHAT DOUBTFUL DISCIPLINE RECEIVED FROM FORMAL STUDIES; HE WILL BE CONTENTEDLY IGNORANT OF THINGS FOR LEARNING WHICH NO BETTER REASON THAN TRADITION CAN BE ASSIGNED. INSTEAD HIS EDUCATION WILL BE OBTAINED FROM STUDIES THAT SERVE REAL PURPOSES. ITS CONTENT, AL AND TRADITIONAL.

—Abraham Flexner.

OCCUPATIONS OF FATHERS AND OCCUPATIONAL CHOICES OF BOYS IN TWENTY-TWO RURAL AND VILLAGE SCHOOLS IN SANTA CLARA COUNTY, CALIFORNIA.

RICHARD ZEIDLER

IN connection with a recent study of the efficiency of arithmetic teaching in the rural and village schools of Santa Clara County, California, certain data were gathered, which are of interest apart from the study of arithmetic. Among other things information was secured regarding the father's nationality and occupation, and the boy's choice of occupation. The replies to these questions furnish the basis for this study. These include the replies of 293 boys in the fifth, sixth, seventh, and eighth grades of 22 schools scattered over the county, and are therefore fairly representative of these grades in the rural and village schools of the county.

The boys range in age from nine to eighteen years, with approximately twenty-two per cent in the eighth grade. Deducting the usual number that will enter the high school, and also considering those that will leave school before finishing the grades because they are old enough to obtain a work certificate, it can be seen that the problem of choosing a vocation is soon to be a real one for the remainder of the boys.

The degree to which these boys have any idea as to what they wish to do in the near future is shown in the following analysis of their statements. Table 1 shows in detail the occupations that the fathers are pursuing and which are chosen by their sons, and shows the distribution of both fathers and sons with respect to their chosen lines of work.

There are sixty-nine occupations chosen in common by fathers and sons, the fathers representing forty, and the sons fifty. This may seem a paradox, but a glance at the table shows that these choices overlap, because many of the occupations of the fathers are chosen by the sons. These occupations are arranged in order of the decreasing number of fathers engaged, from which it will be seen that there are fifteen pursuits followed by one father or more in a hundred. The percentage is still greater for the boys.

TABLE I.

OCCUPATIONS OF FATHERS AND OCCUPATIONAL CHOICES OF 293 BOYS IN THE 5TH, 6TH, 7TH, AND 8TH GRADES IN THE RURAL SCHOOLS OF SANTA CLARA COUNTY, CALIFORNIA.

	Occupation	Followed by Fathers	Per Cent	Chosen by Boys	Per Cent
1	Farmer	170	58.0	79	26.9
2	Laborer	29	9.9	0	.0
3	Carpenter	17	5.8	7	2.4
4	Minister	6	2.0	1	.3
5	Contractor	6	2.0	0	.0
6	Painter	5	1.7	1	.3
7	Fruit Packer	5	1.7	1	.3
8	Blacksmith	3	1.0	1	.3
9	Clerk	3	1.0	1	.3
10	Editor	3	1.0	0	.0
11	Plumber	3	1.0	0	.0
12	Lumberman	2	.6	0	.0
13	Tailor	2	.6	0	.0
14	Wine Foreman	2	.6	0	.0
15	Dairyman	2	.6	2	.6
16	Locomotive Engineer	2	.6	12	4.1
17	Truck Driver	2	.6	1	.3
18	Wine Merchant	2	.6	0	.0
19	Gardener	2	.6	0	.0
20	Real Estate Dealer	1	.3	0	.0
21	Station Agent	1	.3	2	.6
22	Insurance Agent	1	.3	0	.0
23	Medicine	1	.3	5	1.7
24	Saw Filer	1	.3	0	.0
25	Confectioner	1	.3	1	.3
26	Supt. Alms House	1	.3	0	.0
27	Engineer	1	.3	28	9.5
28	Minerologist	1	.3	0	.0
29	Motorman	1	.3	0	.0
30	Manager Telephone Co.	1	.3	1	.3
31	Lawyer	1	.3	10	3.4
32	Grocer	1	.3	0	.0
33	Mechanic	1	.3	38	12.9
34	Road Builder	1	.3	0	.0
35	Nurseryman	1	.3	0	.0
36	Rug Dealer	1	.3	0	.0
37	Conductor	1	.3	2	.6
38	Druggist	1	.3	5	1.7
39	Merchant—Business	1	.3	5	1.7
40	Constable	1	.3	0	.0

TABLE I—CONTINUED.

OCCUPATIONS OF FATHERS AND OCCUPATIONAL CHOICES OF 293 BOYS IN THE 5TH, 6TH, 7TH, AND 8TH GRADES IN THE RURAL SCHOOLS OF SANTA CLARA COUNTY, CALIFORNIA.

	Occupation	Followed by Fathers	Per Cent	Chosen by Boys	Per Cent
41	Machinist			40	13.6
42	Banker			1	.3
43	Chemist			3	1.0
44	Policeman			2	.6
45	Sailor	0	.0	2	.6
46	Architect	0	.0	3	1.0
47	Automobile Mechanic	0	.0	2	.6
48	Oil Well Driller	0	.0	1	.3
49	Mining Engineer	0	.0	1	.3
50	Electrician	0	.0	8	2.7
51	Musician	0	.0	2	.6
52	Stenographer	0	.0	1	.3
53	School Teacher	0	.0	5	1.7
54	Surveyor	0	.0	1	.3
55	Hunter	0	.0	1	.3
56	Cartoonist	0	.0	2	.6
57	Aviator	0	.0	8	2.7
58	Secret Service	0	.0	1	.3
59	Teamster	0	.0	1	.3
60	Bookkeeper	0	.0	2	.6
61	Soldier	0	.0	1	.3
62	Chauffeur	0	.0	4	1.3
63	Ball Player	0	.0	3	1.0
64	Stock Raiser	0	.0	4	1.3
65	Mechanical Draftsman	0	.0	1	.3
66	Navy	0	.0	1	.3
67	Trained Nurse	0	.0	1	.3
68	Inventor	0	.0	2	.6
69	Newspaper Reporter	0	.0	1	.3
70	Not stated	6	2.0	8	2.7
	Total	293		293	

There are a few important occupations followed by the fathers which have no special attraction for the boys. These are shown in Table 2. They apparently are undesirable from the son's point of view. Table 3 shows five occupations which are attractive for the boys, but unimportant judged from the fathers' viewpoint. This can easily be accounted for. There is a greater demand for machinists, mechanics, engineers, electricians, and even aviators at the present time than there

has been in the past, and to that extent, at least, the boys are exercising a wise choice of occupation. It is also gratifying that a fairly large number desire to enter some agricultural pursuit. There yet remain many occupations here which offer constant and comparatively extensive opportunity to young workers, and several which one would expect to make strong appeal to boys, but which are nevertheless rarely chosen. The possibilities for guidance are well shown here. Moreover, three out of every hundred state they have no choice in the matter of future vocation.

TABLE 2.

Five occupations important from the standpoint of the number of fathers engaged, but unimportant judged by the attractiveness for boys.

	Occupation	Followed by Fathers	Chosen by Boys
1	Laborer	29	0
2	Contractor	6	0
3	Minister	6	1
4	Painter	5	1
5	Fruit Packer	5	1
	Total	51	3

TABLE 3.

Five occupations important judged by the attractiveness for boys but unimportant from the standpoint of the number of fathers engaged.

	Occupation	Followed by Fathers	Chosen by Boys
1	Machinist	0	40
2	Mechanic	1	38
3	Engineer	1	28
4	Aviator	0	8
5	Electrician	0	8
	Total	2	122

Returning to Table 1 we note that altho the boys are scattered over fifty different occupations, yet over one-half are included in only three vocations, and nine callings include two-thirds of the number. It is also interesting to note that the majority of these occupations require careful and special training, such as engineering, law, medicine, and even modern agriculture.

Will the boys meet competition? Judged by the number of fathers engaged, there will be two jobs for every carpenter, and two farms for every farmer. But, what about the remaining seven? There will be thirteen mechanics for every job; more than nine engineers for every engineering position; four locomotive engineers for every engine; nearly three electricians for every job; etc. Where will those go who are crowded out by competition? Will they go back to the farm? If so, they will be compelled to compete with those who have had longer experience, perhaps, and who possess special training in agriculture. This unequal condition is brought out more clearly in Table 4, where the five most important occupations of the fathers are placed side by

side with the five chosen most frequently by the sons, each in the order of importance. It will be noted that farming is foremost in both groups, but that the second and fifth most important occupations of the fathers were totally ignored by the sons, and that the second most important choice of the boys is unoccupied by any of the fathers, while the third, fourth, and fifth are nearly ignored.

TABLE 4.

Comparison of Five Most Important Occuations Held by Fathers with the Five Most Frequently Chosen by Sons.

Occupation	Followed by Fathers	Per Cent	Chosen by Boys	Per Cent
Farmer	170	58.0	79	26.9
Laborer	2.9	9.9	0	.0
Carpenter	17	5.8	7	24.0
Minister	6	2.0	1	.0
Contractor	6	2.0	0	.0
Farmer	170	58.0	79	26.9
Machinist			40	13.6
Mechanic	1	.3	38	12.9
Engineer	1	.3	38	9.5
Locomotive Engineer	2	.6	12	4.1

It appears therefore that there will need to be considerable shifting about before the boys will finally find their niches in the world. Therefore the need of some vocational guidance which will prevent the inevitable disaster for many a bright ambition is evident. How can the rural and small village schools accomplish this guidance? This problem offers a good plea for rural supervision.

It will be impossible to offer training for as many different occupations as are shown in the tables, but a good foundation for many of these lines of work can be laid, and real technical training could be offered in several of them.

Table 5 classifies the sixty-nine occupations into five groups, and shows the number of fathers engaged in each of the five occupations, and the number of boys desiring to enter. The trades attract the largest number of boys, while agriculture stands second, and the professions third. It is rather surprising that so small a per cent wish to enter business.

It is natural to ask to what extent can the rural and village schools, with their present teaching corps and equipment, meet the desires of these boys with respect to occupational training? Each of the five groups demands a separate type of training. And since each demands a sort of training unlike that necessary for the others, each group makes demands of a separate type upon teaching curricula, equipment, and

TABLE 5.

Classification of Occupations and Choice.

	Occupation	Followed by Fathers	Per Cent	Chosen by Boys	Per Cent
1	Agriculture	175	59.7	88	30.0
2	Trades	44	15.0	126	43.0
3	General Service	47	16.0	26	8.8
4	Professions	11	3.7	48	16.4
5	Business	17	5.8	5	1.7

method. The first group (agriculture) demands a training in knowledge of soils, crops, farm equipment and mangement, etc.; group two (trades), a training in tools and materials; group three (general service), a general training varied as much as possible to meet the needs of the individual; group four (professions) requires a broad general training more or less of the old traditional type, since the occupation lies so far ahead; group five (business) requires a commercial training.

To what extent the rural and village schools should offer the training required for each of the five groups is not yet clear, but that definite training looking toward each of these groups is possible every one will admit. On the whole, there need be less suggestion as to *how much* of each kind of training to give than *what kind* is wanted. To a great extent, at least, the rural schools will fulfill their function and meet the desires and needs of the country children if they will not educate them away from country life. It is not expected that the rural school will select an occupation for a boy and direct him into it, but rather that it will give him the opportunity to try himself out in many and thus assist him in making an intelligent choice.

NOTE: Readers interested in comparing the occupational choices of boys in rural communities with the occupational choices of boys in cities are referred to a study made by Professor J. B. Sears of 1,039 boys in grades seven and eight of the Oakland, California, Schools; *School and Society*, May 22, 1915.

THE KITCHEN BOILER.

J. H. TIPTON.

THE plumbing fixtures of a modern house furnish valuable work for manual training students. The problem of putting hot and cold water into a house is within the ability of high-school students. The problem is especially valuable to young men from rural homes, where these conveniences are not usually found.

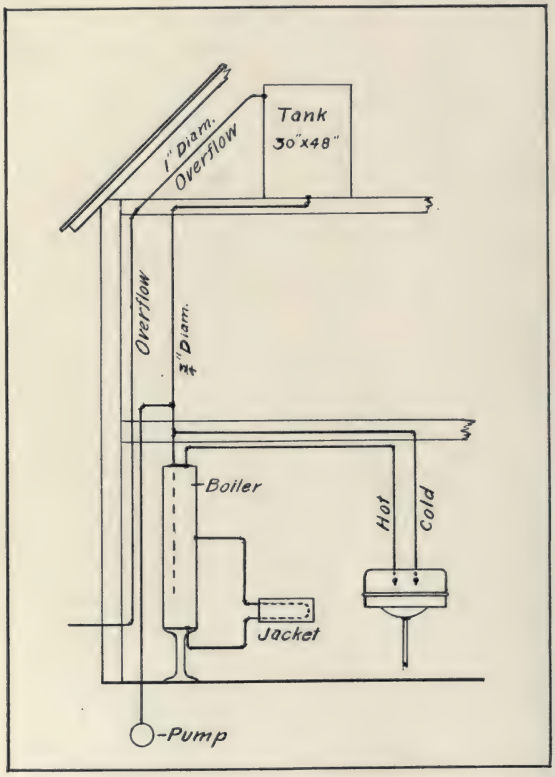


FIG. 1. SYSTEM OF WATER SUPPLY.

Its educational value consists in directing the students' attention to the general arrangement of the system; the physics of the circulation of hot water is discussed; and the teacher has an excellent opportunity to ex-

plain, to interested students, the principles of pumps, motors, windmills, and gasoline engines. The operations of cutting, threading and fitting pipes have a value similar to exercises involved in woodwork.

TO PIPE A HOUSE FOR HOT AND COLD WATER.

Water can be put into nearly every house in one or another of the following ways: city service pipes, flowing wells, pumping by means of a windmill, gasoline engine, or electric motor. Assuming, then, that it is necessary to elevate the water by pumping, the following simple sketch, Fig. 1, will show the system. The cost of pumping is insignificant, for suppose a supply of 800 gallons a week is necessary—this will supply a family of eight persons—and it must be pumped 50 feet. With electricity at 10 cents per k. w., the cost would not exceed 5 cents. A 1/6 h. p. motor would be required to run only about one-half hour per day.



FIG. 2. PIPE TOOLS.

To do the work the following tools and materials are necessary: (a) pipe vise, pipe cutter, pipe dies, and two pipe wrenches; (b) elbows, tees, couplings, unions, bushes, reducers, boiler, valves, and ¾″ pipe, Figs. 2 and 3.

PRINCIPLE OF THE KITCHEN BOILER.

The principle of the kitchen boiler is very simple. The circulation of water depends upon the fact that warm water is lighter than cold water. Therefore when the water in the jacket becomes heated it rises and goes to the top of the boiler, while the colder water sinks down and takes its place. The top of the boiler then contains the hot water and the bottom the cooler water. This circulation continues so long as there is a difference in temperature, Fig. 4.

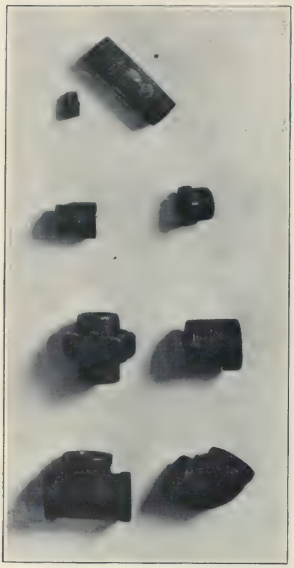


FIG. 3. PIPE FITTINGS.

DOING THE WORK.

The tank may be placed above the kitchen; in the attic or any convenient place above the boiler. It may be made of galvanized iron, and if 30″ in diameter and 48″ high will hold about 150 gallons; enough to supply a family of eight persons for at least a day. The tank, boiler and jacket are set in place. A sketch, Fig. 1, shows the general arrangement and the several fittings.

OPERATIONS.

The length of a pipe is the distance between the fittings plus the distance (usually about ½″) the pipe is screwed into the fittings.

In cutting pipe the cutter should be perpendicular to the length of the pipe while it is turned around, so that the cut is at right angles.

Care must be taken in threading the pipe that the die is held at right angles, so that the thread may be square with the length of the pipe. The threading should be continued until the end of the pipe comes thru, flush with the die.

In starting the threaded end of the pipe into any of the fittings, care must be exercised that the threads "start straight." A few turns by hand will be necessary before using the wrench. With a 14″ wrench a little more force will be required than that used in planing. Before

the end of the pipe is introduced into the fitting, both the inside and the outside threads are smeared with a paste of black lead and oil. This mixture serves to fill the irregularities of the threads, and prevents the joint from leaking.

USE OF FITTINGS.

Elbows are used to turn angles of 45° or 90°. Tees are used to

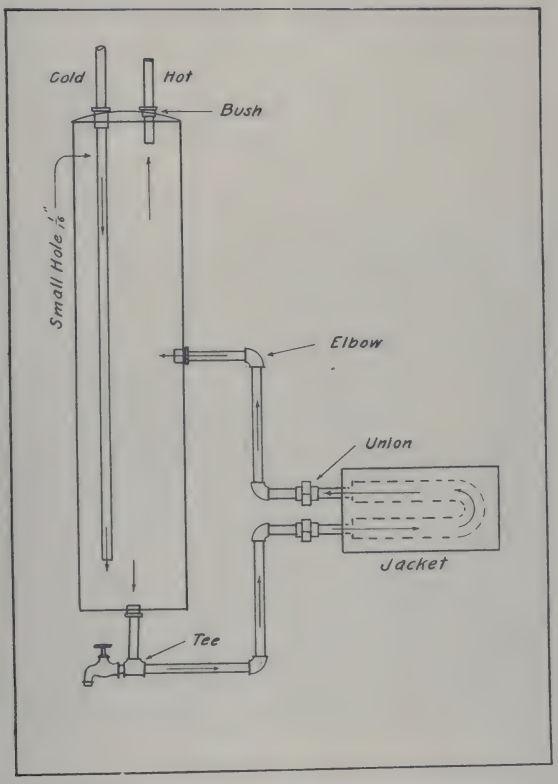


FIG. 4. ARRANGEMENT OF KITCHEN BOILER.

join one pipe at right angles to another. Couplings are used to join lengths in the same straight line. Unions join two pipes which come from opposite directions. The pipes are screwed into fittings from opposite directions, or they are introduced in a line of pipes where it is necessary to disconnect occasionally, without unscrewing the whole line.

Right and left hand couplings are used for the same purpose. The connections between the boiler and the jacket, and between the tank and the boiler, are provided with unions for the reason given. Nipples are short pieces of pipe threaded at both ends.

CLEANING THE WATER JACKET.

The water jacket in the course of a few months, or in a year, or two, becomes coated on the inside with the deposit from the water. Nearly all water contains lime, magnesia and iron in solution. When the water is heated these substances are precipitated and form a deposit. The well known deposit inside the tea-kettle is produced in this way. The deposit is made inside the water jacket until it becomes clogged, and the circulation cannot take place freely. This interrupted circulation makes a noise whenever the fire is started briskly, and it keeps up as long as the heat produces steam in the constricted parts of the jacket. Whenever the system becomes noisy, it is necessary to remove the jacket and clean it.

This is done by first emptying the whole system, except the tank, the valve between the tank and the boiler being closed. If the tank is small it is best not to have a valve between it and the boiler. Then the water is drawn off from the whole system by means of the valve at the bottom of the boiler. The unions between the boiler are disconnected and the jacket removed from the stove. As much *as possible of the deposit* is removed by mechanical means, such as scraping with a piece of wire. Then dilute hyrdochloric acid, about one part of acid to eight parts of water, is poured into the jacket. The acid dissolves the deposit, with effervescence, for the deposit is largely a carbonate of lime. The action of the acid is continued until all the deposit is dissolved, after which the jacket is well washed out with water. Then it is connected in place again, the system filled with water and a fire started in the stove.

THE CHILD AND HIS GARDEN TOOLS.

HUGH FINDLAY.

We are quite certain that the purpose of printing these pictures will be apparent to every reader. They tell their own story, and we hope this telling of it may save some boy or girl from the bad effects of using improper tools or using tools improperly while engaged in the fine art of agriculture, gardening.

The taking of these pictures was suggested to the author as he saw mistakes frequently made by children while working at gardening.—ED.



THE WHEEL-BARROW IS TOO LARGE FOR THIS STURDY BOY, AND WITH SUCH STRAIN HE WILL SOON GROW TO HATE HIS WORK AND HIS GARDEN WILL BE NEGLECTED. LOST ENERGY EQUALS FAILURE.



NOTE THE EXPRESSION OF STRAIN ON THE CHILD'S FACE. THE CAN IS NOT ONLY TOO LARGE BUT THERE IS TOO MUCH WATER IN IT. CHILDREN DO NOT KNOW HOW TO CARE FOR THEIR ENERGY, OR THE LIMIT OF THEIR STRENGTH. THE JOINTS OF THE BONES ARE STRAINED, AND THE CHILD'S HEALTH IS IN DANGER.



THERE IS NO STRAIN IN CARRYING THIS SIZED WATERING POT, AND THE CHILD IS PLEASED TO FILL IT TO THE TOP WITH WATER. PLEASURE SHOULD BE REALIZED IN ALL EFFORT.



ALL CHILDREN, LIKE MANY GROWN UPS, ATTEMPT GREATER BURDENS THAN THEIR PHYSICAL BODY CAN STAND. THE SPADE IS TOO LARGE AND THE CHILD IS IN DANGER OF CURVATURE OF THE SPINE.



THE PROPER SIZED SPADE. WHILE THE CHILDREN ARE WALKING, AND ESPECIALLY WHILE CARRYING SOME IMPLEMENT, THEIR BACK BONE SHOULD BE STRAIGHT.



WEEDING WITH THE HEAD DOWN NOT ONLY TIRES THE BODY, BUT CAUSES THE BLOOD TO FLOW TO THE HEAD. THIS MAKES MOST CHILDREN FEEL SICK, AND WILL MEAN THAT THE PARENTS WILL SOON PREVENT THEIR CHILDREN FROM COMING TO THE GARDEN.



AFTER THE DAY'S WORK IS DONE THE BODY SHOULD NOT BE TIRED OUT. WEEDING IN THIS MANNER IS A GREAT SAVER OF ENERGY.



MANY CHILDREN COME TO THE GARDEN IN THEIR BARE FEET. RAKES AND HOES WITH THE SHARP EDGE UP HAVE CAUSED SOME PAINFUL ACCIDENTS. STORIES OF SUCH NEGLECT ON THE PART OF THE ONE IN CHARGE OF THE GARDENS OFTEN CAUSE UNNECSSARY TROUBLE.



THE GARDEN WORK SHOULD TEACH THE CHILDREN TO BE OBSERVING AND THOUGHTFUL OF OTHERS. IT IS NOT ALWAYS BEST TO CRITICISE THE CHILD FOR LEAVING THE TOOLS WRONG SIDE UP; RATHER SUGGEST THE DANGER.

REED WEAVING.

L. Day Perry.

REEDS which are used extensively for basket-making and weaving in general are procured from the species of palm described in a previous article on cane weaving.[1] These reeds should not be confused with the term reed applied to several distinct species of large water loving grasses. Such reeds are usually designated under the name of grasses. There are a thousand species of palm distributed over tropical regions of the entire world, but only a very few are native in the United States, and these are of no distinct commercial value. The rattan or cane palms of India and the Malayan Islands grow to an unusual height, and are imported into this country in great quantites. These rattans and the trailing palm of the species *Calamus* have as main export centers Singapore and Calcutta. These palms are stripped of leaves and bark and split into round and flat strips of different diameters and widths. The other bark, when stripped into proper sizes, is known as chair cane; the entire palm, with leaves removed, is commercially known as rattan; and the flat reeds are frequently sold as flat rattan and pith cane. Inasmuch as these flat and round strips, split from the palm plant and exported under the name of rattan, are called reeds, we shall refer to them under that name in all discussions to follow. There are two qualities of reed on the market sold under the names China reed and German reed; the former is inferior in quality, and the latter is superior, being strong, tough and durable.

Reed may be procured in large or small hanks, in coils and in bundles, with the cost determined by weight. Schools generally will find it advantageous to buy it in small hanks, for ease in handling and for economical reasons. Various round reeds are shown actual size in Fig. 1 from No. 0 and including No. 7, also winding, half-round and flat reed. Winding reed is thin and slightly rounded on one surface. Half-round is as its name implies. Flat reed may be obtained in several widths from ¼″ to ½″, and if of good quality, one surface will show a decided bevel on the edges, and appear much smoother than the other, thus determining the right side. There are many more sizes on the market than are indicated in Fig. 1, but those shown should supply adequate, if not liberal variety for the ordinary school shop.

[1]In the February, 1916, number of this Magazine.

The cost of reed cannot be given with any great degree of accuracy at present. The price is determined by the quantity bought and by the quality and size. Under normal conditions round reeds would cost from $1.00 to 30 cents per pound for Nos. 1 to 8, and flat reed about 25 cents.

Reed is procurable either bleached or unbleached, but ordinarily it is better to buy the bleached product. However, if the worker desires to bleach the reed, the method for small quantities is as follows: In a tub two-thirds full of water dissolve ten pounds of chloride of lime,

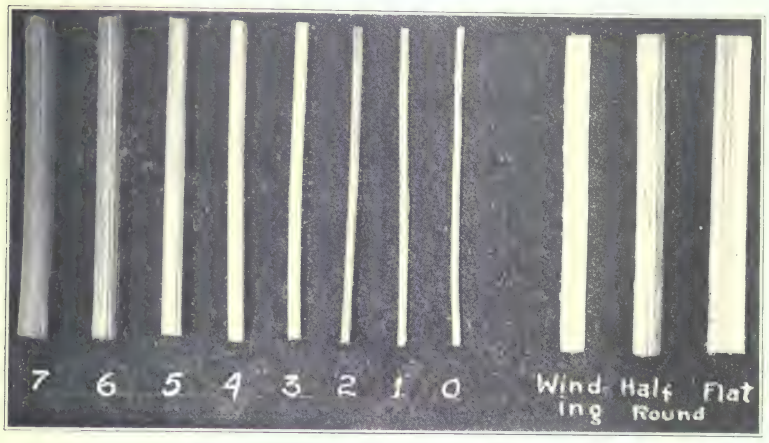


FIG. 1. SPECIMENS OF REEDS, FULL SIZE.

immerse the reed in this solution, weighing it down to insure covering it all, and let it stand about four hours. Then remove it from the tub and wash thoroly in running water. The best way to do this is to lay the reed on an inclined surface and turn a forceful stream of water upon it. Chloride of lime has a bad effect upon the hands in that it makes them sore and tender, so care must be taken to properly rinse the reed. A small amount of tallow rubbed over the hands will materially offset any tendency to tenderness, and generally keep them in good condition.

Bleached reed takes stain much more readily and evenly than does the unbleached. It may be stained any color with the prepared stains, but ordinarily these leave the reed muddy in appearance, due primarily to the difficulty in properly brushing in or wiping off the stain in the recesses which weaving leaves. Perhaps the best agent for coloring

reed, especially after it has been woven, is naptha. The process is this: Obtain the necessary variety and amount of colors ground in oil; mix the required colors with a little naptha; then to determine the shade of color, test it with a reed. Reed absorbs a given amount of color, therefore, the shade will prove practically the same when tested with a small quantity of naptha, as when tried out with a greater amount. Now add the required amount of naptha to the solution, avoiding thinning too much; otherwise the color produced will be "sickly" in appearance. Two pounds of color to about five gallons of naptha should prove about the right ratio.

Coiled hanks of reed may be immersed in the solution, immediately withdrawn, and hung up to drain dry, above the receptacle, permitting surplus stain to drain back into it. The stain may be used repeatedly, and as it is very volatile it should be kept in a tightly corked red can when not in use. It is also highly inflammable, and should be used in a room in which there is free circulation of air. If colors have been mixed properly, and thinned to the right consistency, the color will dry out rapidly, sharp and clear, free from muddy effects.

A woven article such as a basket or woven top foot stool may be dipped or the color poured over, then allowed to drip dry. Then, in the case of a foot stool, the wood may be stained a darker shade in the usual manner with a prepared stain. In stools such as are illustrated herewith, the reed is usually left natural. Reed may be shellacked or varnished. Because of its porosity it soils very easily unless some finishing agent is used, and a good grade of elastic varnish is to be recommended as a finish, especially on stools which are subject to severe use.

OTHER MATERIALS.

Reed is not the only medium which adapts itself to weaving, either in correlation with wood, or when used alone. On the stools illustrated several other materials may be used such as hickory splints, ash splints, binding cane, fiber, and rope. In fact three of these mediums have been utilized in these stools. Paper fiber was discussed in detail in a previous article on rush seating[2], and need not be elaborated here. Fig. 10 shows a stool partly woven with this serviceable material. Sufficient to say that this fiber adapts itself admirably to almost all work where reed is commonly employed, and in many instances commercially, is supplanting reed.

[2]In the April, 1916, number of this Magazine.

Hickory and ash splints and cane are likewise to be unreservedly recommended for such work as is here illustrated. Hickory splints may be obtained from manufacturers of rustic furniture, or they may be obtained first hand if hickory trees grow in the locality. In the spring or early summer when the sap is up and the bark slips easily, a hickory tree may be cut down, and the rough outer bark shaved, with a draw knife, from the top of the log the full length of the trunk, leaving a surface from 8″ to 10″ in width. With a heavy knife split the inner bark on either side of the shaved strip; then beginning at one end peel back the inner bark the full length of the log. This process may be repeated until the log is stripped. The thickness of the inner bark depends upon the size of the tree, and the species. Manufacturers of hickory furniture claim that the pignut possesses a thicker bark than any other species, the bark running from ¼″ to ¾″ in thickness, and they accordingly use this tree in preference to others. The rolls of thick bark obtained by the stripping should be allowed to dry for several weeks. Then place them in water until they become pliable, previous to splitting them into strips of required width and thickness. Factories use a very simple motor driven machine to do this, but any manual training shop could devise some scheme for accomplishing the work. These strips, cut to any length, must be made pliant by thoro soaking previous to use. In weaving they should be pressed close together with the fingers or hammer, as there is a shrinkage of about fifteen per cent in the width. Such splints are used mainly by builders of rustic outdoor or porch furniture, for the weaving of the backs, arms, and seats of chairs, and have at present no general use in school shops. Their use there should be encouraged. If bought from the manufacturer these strips or splints cost 15 cents per pound, dry. The strips are sent coiled, and are ¾″ in width by $\frac{1}{16}$″ in thickness. They may be stripped into various widths with a hand stripper soon to be described.

Another kind of hickory splint may be obtained from dealers in the raw product, or direct from the producers. These splints are stripped from the wood of the tree, and are sold in coils of a dozen strands each. These strands are approximately 10′ long by ½″ wide, and slightly less than $\frac{1}{16}$″ thick. The coils weigh about three-fourths of a pound each and cost 5 cents.

Ash splints are prepared in practically the same manner as are those of hickory. The ash and hickory splints are a beautiful white, while that of the inner hickory bark is a nut brown color. Commercially the ash

splints come in lengths of about 10′ to 15′, about 2″ wide and $\frac{1}{16}$″ thick. The weaver must split these to desired widths by means of a hand stripper similar to the one in the sketch, Fig. 2. This stripper is about 3″ wide by 7″ long and made of hard maple. The cutters are made of a watch spring, pointed and sharpened as indicated. The end piece on the stripper is removable to permit of changing the cutters. To use, merely hold the splint flat between the left hand and stripper, and pull it across the cutters with the right. It is policy to make several of these tools with cutters different distances apart, so various width splints may be obtained without resorting to a change of cutters. Ash splints need to be soaked before using, and will be found

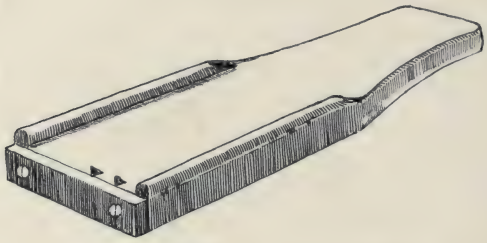


FIG. 2. SKETCH OF HAND STRIPPER.

to be somewhat less pliable than hickory but will serve their function quite as well. Ash and hickory splints swill stain very well, while the inner hickory bark splints should not be stained at all.

Ash splints are extensively gathered and prepared by the Indians in certain sections of Canada, and in the northern states. They are woven into baskets of intricate design and beatiful colors, and may be used for almost every purpose for which flat reed is utilized. The splints cost about 35 cents a pound, dry.

THE WEAVING PROCESS.

Fig. 3 shows several stools of different design both in wood construction and in weaving. In two instances it will be noted that the weaving is done over a separate frame, one being inserted between the rails, the other fastened on top, leaving a little projection. The discussion of weaving to follow is confined to stools and seats. Reference is made to several possible weaving designs, and the use of various

mediums and combinations. The possible combinations of materials are merely suggestive of possible other ones, and the individual worker will find that many designs of varying complexity may be worked out.

The stool top illustrated in Fig. 4 employs a simple over-and-under weave utilizing flat reed. The worker should decide at the outset on



FIG. 3. WOVEN TOP STOOLS.

the character of weave to be used—in this instance, over *three* and under *three* strands. To begin the operation tack an end of the reed under a short rail at a corner; then bring the strand out and over the rail, across the frame opening to the top of the opposite rail, under this rail, across underneath the frame opening to the bottom of the first rail. Repeat three times; then wrap each rail entirely around as indi-

cated in the photograph, thus leaving an area the width of the reed every *fourth* strand. The strand crosses only underneath the frame in this instance. Repeat these series of three strands until opposite short rails are wrapped. Whenever a reed runs out tack the end underneath a rail, and begin a new reed at the same point. This applies to all directions to follow. The weaving proper now begins.

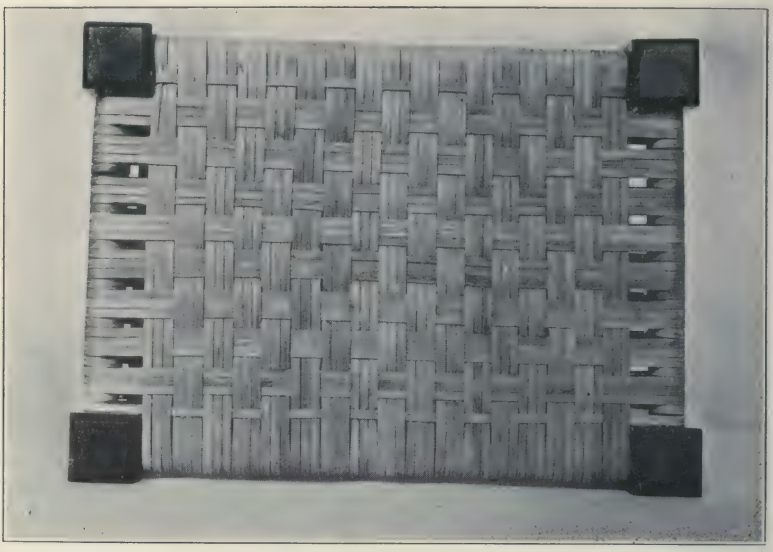


FIG. 4. OVER AND UNDER WEAVE.

Tack a reed underneath a long rail at a corner; then weave *over three* strands and *under three*. Repeat in the same manner three times; then weave *over* the series which were woven *under* before, and repeat until all areas are filled on the stool top. Note that in filling the short rails one strand only was left. To balance this a single strand was run in on the opposite side after all other weaving had been completed. The ends of this strand are not fastened in any way. The vacant spaces on either short side could be filled in a similar manner if desired. Strands crossing underneath the frame should be woven in some manner to produce a seat of proper strength. The character of such weave is not material; in this instance it might take the same form as the top.

Fig. 5 shows a stool top woven of ¾″ hickory splints, employing a diagonal weave. Begin the wrapping on either the long or short rails. In this instance we will assume that the short rails have been wrapped; then the actual weaving will begin over the long rails, and as indicated, at the upper left hand corner. The strands have been numbered to make the description clearer. The "diagonal" is determined at the edges of the upper rail. Strand 1 runs over one, under two, over two and so on across the frame; strand 2 runs over two, under two, and

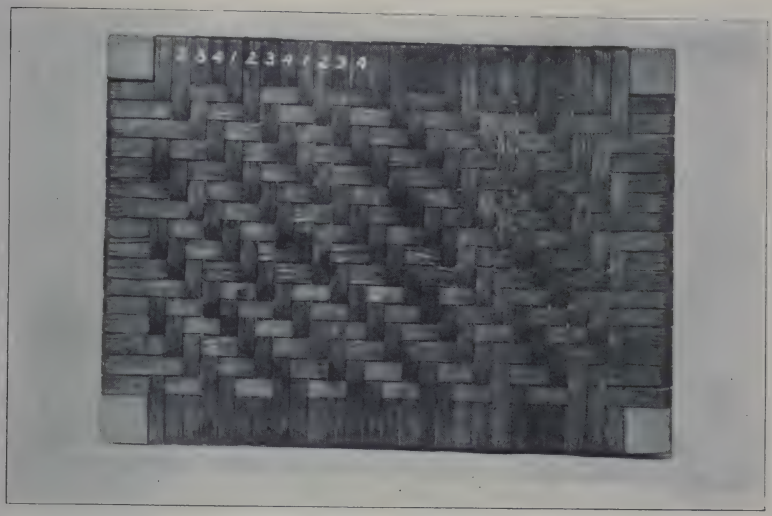


FIG. 5. STOOL TOP OF HICKORY SPLITS.

repeats; strand 3 runs under one, over two, under two; and strand 4 runs under two, over two, and so on. This completes the series or unit, and this unit repeats itself until the weaving is completed. The diagonal effect would remain the same whether or not the weaver would run over and under three strands or more. In using hickory splints care must be exercised to keep the strands close together, for they shrink materially in drying.

A combination of half-round and flat reed is illustrated in Fig. 6. The half-round reed should be run in first, and in this case, every other strand is wrapped entirely around the opposite rails. The diagonal weave is employed, and is identical to that just described, except that the weaver runs over three and under three in the body. Note the

difference in starting at the edge of the rail. When using half-round reed it is necessary that every other strand be wrapped around the rails, for otherwise it would be practically impossible to weave the area; this is because of the thickness of the reed. A winding reed, as shown in Fig. 1, or binder cane, could be run continuously, inasmuch as either is relatively thin. Weaving with the two reeds, as shown produces an area of pleasing high relief.

Fig. 7 illustrates a stool woven in flat reed. The diagonal weave is used running toward a common center, and forming a diamond effect

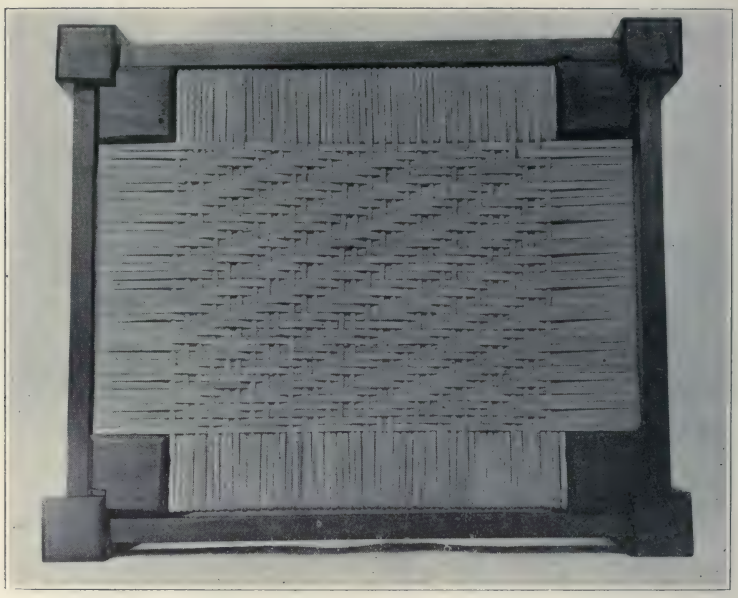


FIG. 6. STOOL TOP OF FLAT AND HALF-ROUND REED.

or pattern. Begin wrapping on the long rails, skipping every other strand as indicated. After the long rails have been filled, the actual weaving is begun. To weave this pattern it is necessary to locate the center of the short rails and the center strand of those running across the frame. In this instance the strands are even in number, so the pattern does not begin at the actual center, but a little to the right. Beginning at the center, count by two, over, under and over, under, to determine the number of strands to go over or under in starting at the edge of the frame. This first strand runs over *one* at the center, and

under two and over two on either side. The second strands run under *three* at the center, and over two, under two on either side, so the worker again must count to the edge of the frame to determine the beginning weave, until the unit of four strands has been woven. Then the unit repeats itself *at the center* and *at the edges* of the frame. The better practice is to complete one-half of the frame on one side of the center before beginning the other half. Errors in weaving this pattern are easy to make, because of the fact that the strands and units must be watched

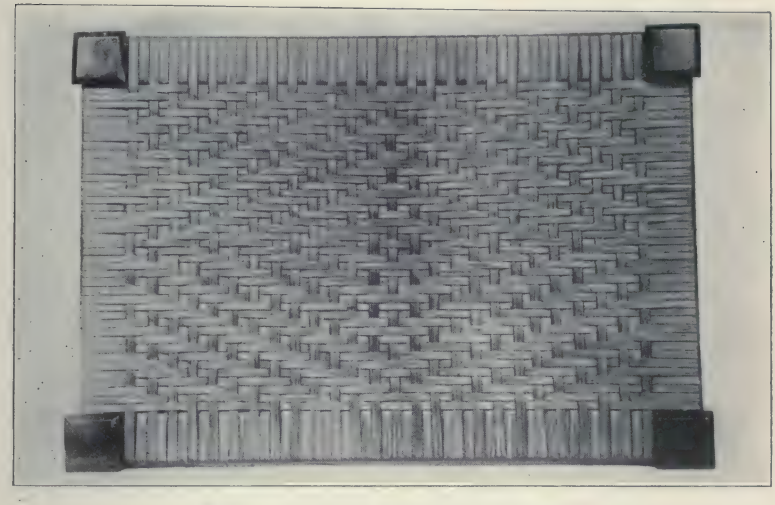


FIG. 7. DIAMOND DESIGN IN FLAT REED.

at two places. A study of the photograph will supplement this description, if it proves in any way incomplete.

The top illustrated in Fig. 8 employs the same weave as that just described. The short rails are wrapped first and weaving is done over the long rails. It differs with the stool top shown in Fig. 6, not only in weave, but in that the half-round reed is used as a weaver; in Fig. 6, flat reed is the weaver.

Fig. 9 illustrates a stool top woven with flat reed, in a pattern the very opposite in effect of that shown in Fig. 7; instead of producing a diamond effect the diagonals appear to run out from a common center. The method of weaving is identical to that of Fig. 7. No detailed description of the weave will make the process as clear as a close study of the photograph, and working out the weave from it. An error exists

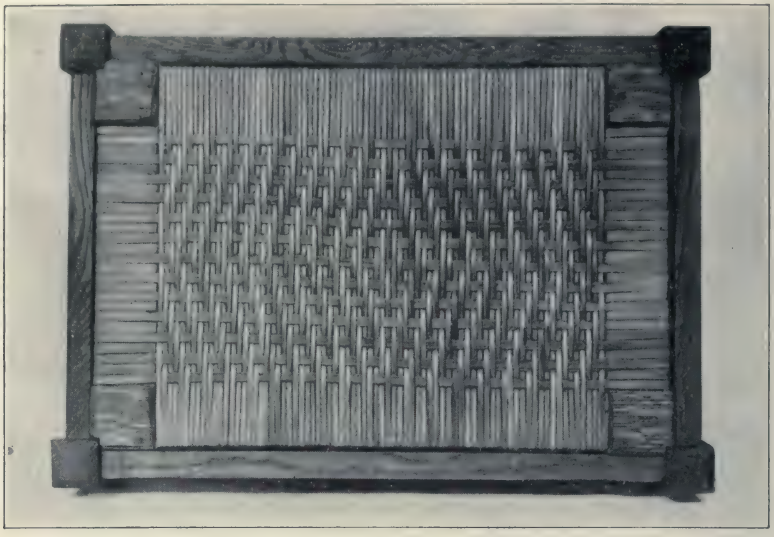


FIG. 8. DIAGONAL WEAVE EMPLOYING FLAT AND HALF-ROUND REED.

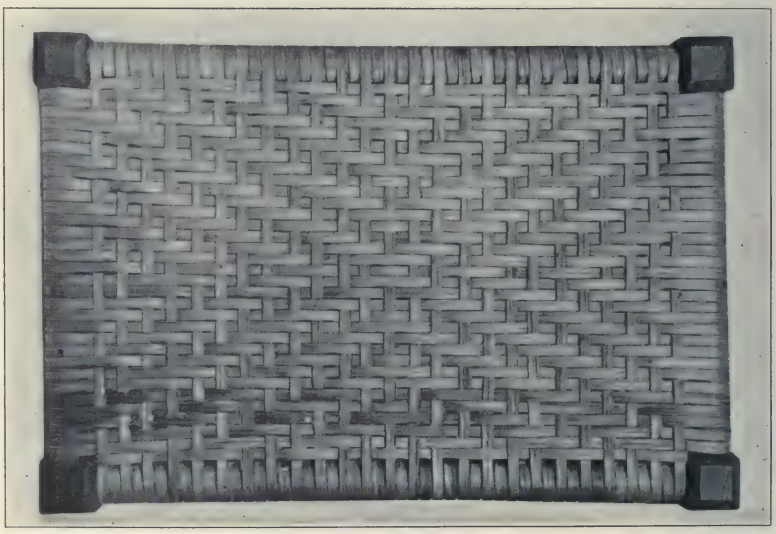


FIG. 9. WOVEN DESIGN IN FLAT REED.

in this photograph which may be detected by close observation, but it is not vital.

Fiber is the material used for the top of the stool illustrated in Fig. 10. The diagonal weave is employed, and needs no further discussion. Fiber was discussed in detail in a previous article on rush seating. It adapts itself admirably well to this form of weaving and when properly

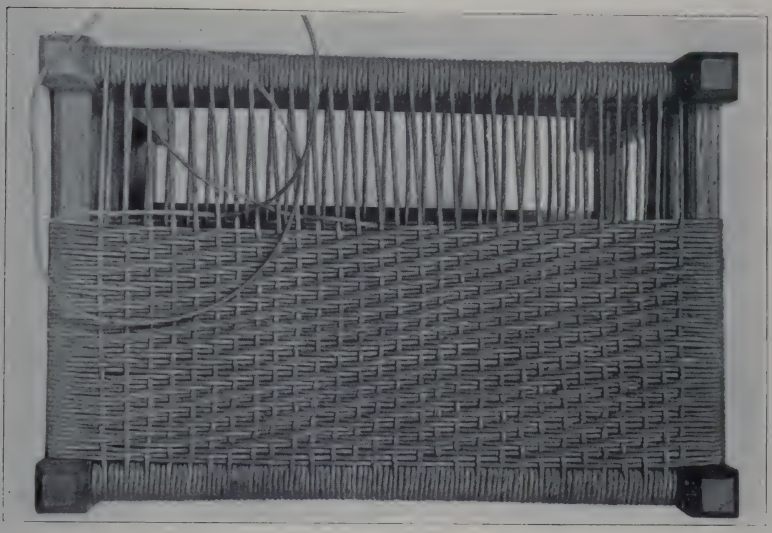


FIG. 10. STOOL TOP WOVEN WITH FIBER.

finished in varnish produces a very serviceable seat, pleasing in every detail.

It would prove a difficult task to make a fair estimate of the value the use of such mediums as cane, reed, rush and allied materials has in manual training shops and in schools generally. The use of such materials produces very definite reactions upon boys who could not be reached by woodwork alone, awakening them to an interest in work, and making them workmanlike and exacting in construction. There is some element in such mediums which cannot be defined, but which nevertheless stimulates the average or mediocre boy to do the best work of which he is capable. Experience with these materials utilized in correlation with wood will prove the truth of these statements, and demonstrate that they are distinctly not only worth while, but vitally necessary, especially to grade school boys.

"PREVOCATIONAL"—WHAT'S IN A NAME?

JAMES MCKINNEY.

THE trouble in understanding what we mean by prevocational training, came, I think from selecting a term which has a very broad application, and comparing it to some specific, narrow, or concentrated piece of work. However, this particular dissent is not so much concerned with the term, "prevocational," (so long as we all agree it means "trying out"), but rather with the practice which has developed within the borders of the prevocational school.

All education is prevocational, even the traditional education was a trying out school for a goodly number of people; and altho the traditional three R's were not providing an adequate preparation for the masses who were destined to go into industry, the system at least gave something which helped to fit people for life.

When it was discovered that the traditional schools were not meeting the average child's need; that boys were leaving the school in large numbers as soon as the age limit would allow them; that these boys were going into industry, blind as to its possibilities, and totally unprepared for its demands; and the apprenticeship system was no longer holding a way out for the great mass of industrial workers, the Industrial Education movement made a big step forward, and the various vocational schools with the "pre" came into being.

The function of this prevocational school was to take the pupils who were not fitting in the traditional school, and give them work which was to more adequately prepare them for life; and for the majority of the class it meant a life in industry. The course of study was largely based on the supposition that these children were destined to become skilled mechanics, and they therefore were given some *pre-trade* training in woodwork, electricity, machine shop work and printing; with some variations according to local needs. As a matter of course it was found impossible to place these misfits, whom the school principals had gladly dumped on this new school, in a scheme of education requiring an attitude of serious and prolonged attention, patience, and native technical ability; and so, when the vocational man was forced to choose between the students and the course of study, he took the path of least resistance, and changed his pupils. His boys are now largely a picked group, and they are getting a good *pre-trade* and *pure trade* training. As an en-

thusiast for industrial education, I am in sympathy with this kind of education, but I still question the advisability of giving this kind of work to twelve or thirteen-year-old boys. I feel that a boy should be at least fifteen years old before he takes this work which requires this adult and technical point of view. What chance does this learning of trade stunts and tricks give a young boy for any real try-out of his desires, aptitudes and interests. In trying to make a boy a little man there is a danger that he may remain a little man.

The schools which are at the present working under this nomenclature of "prevocational" are in the zenith of materially quantitative, and dollars-and-cents success. In these days of cheap economy and efficiency, when budgets are apt to be discussed more than children, a school which can make equipment for the board of education will always be received with favor. It is quite possible that the benches and other part of equipment which the prevocational schools are making for the manual training shops are good substantial products, but we cannot help seeing a rather curious incongruity in the fact that these good people who are supplying these things for the manual training teacher, are the same persons who told us, not so many years ago, that manual training was a back number in educational progress. I have always held there was no justice or reason for comparing the work done under the name of manual training with any specialized field of *pre-trade* or *pure trade* training when the factors of time and equipment are so different. At present the prevocational schools are taking care of a very small number of the misfits in the elementary school, and if one may read the signs of the times with any understanding, the recent legislation and the efforts which are being made to advance the school age limit, will make the problem of keeping children in the traditional school a very difficult proposition.

The solution of the problem will come when the common school will make real efforts to develop the uncommon qualities of all its pupils; when every child will get a chance to unfold his own peculiar personality; and when all children from their earliest years, test out their powers in shop and laboratory and studio and classroom. In such a manner will the elementary school become the real trying-out and appreciative school instead of a series of special schools which have a tendency to break up the unity and democracy of the elementary school. I will risk prophesying that this change will eventually come, not because we primarily believe that to make a living is man's chief end, but because we are members of an industrial democracy which is founded upon the proposition of unity, *interdependence* and service.

THE EDUCATIONAL SURVEY OF CLEVELAND—IV.

W. E. Roberts.

FOURTEEN sections of the report of the Cleveland Survey have been published. Of these, eleven sections have been briefly outlined in this Magazine beginning with the February number.

BOYS AND GIRLS IN COMMERCIAL WORK.

Bertha M. Stevens.

About 22,000 persons are employed in clerical work in Cleveland. Statistics of this section, which are probably typical, show that, in general, commercial work for boys is progressive; for girls, static. Boys as a rule do not stay in the work in which they begin; girls do. Boys follow lines of promotion from one type of work to another; girls are promoted for increased efficiency in chosen lines. For boys, advancement depends more upon ability than specific training. In clerical work a majority of boys are clerks and bookkeepers; of girls, stenographers and bookkeeping assistants. A minority of girls and women hold positions usually held by boys and men, and a few boys are employed as stenographers.

The wider opportunities for boys make specific training difficult except in continuation classes; limited opportunities for girls make specialized training possible and continuation training less necessary.

Vocational training must consider likenesses, while guidance may consider the differences in business. In succeeding chapters, the report treats of the factors common in business, and then of the like and unlike factors in a variety of important types of business and occupations. Transportation and public utilities, retail business, wholesale business, manufacturing, banking, civil service and the small office are discussed in their relation to clerical work. Consideration is also given to the extent and organization of business in Cleveland, the distinctions between the work of boys and girls, the theory and practice of advancement, and special requirements in training and qualifications. A chapter on wages answers statistically the questions of how wages in Cleveland clerical positions compare with other occupations, in what businesses they are best paid, how they compare with each other, whether better in the large or small office, whether education and specialization are wage

assets, and how wages differ for boys and girls. The various opportunities for commercial education in Cleveland public, parochial, philanthropic and private day and night schools are compared somewhat in detail as to numbers, methods and results. An interesting chapter presents the views of commercial pupils themselves, particularly in relation to undifferentiated work for boys and girls.

The general recommendations urge a full high-school course, and a shorter course for those who cannot afford the full time. A foundation in English and the three R's is essential. The four elements of commercial instruction are described as those providing general information, those developing reasoning, accuracy and other necessary qualities, those giving training to be directly applied in wage earnings, and those which are broadly educational. These are to be equitably and harmoniously distributed as required and elective subjects, with due regard for differentiation for boys and girls, and as to regular and continuation work. A study of business offices shows three subjects to be fundamental—arithmetic, penmanship and bookkeeping. These are discussed as to kind and requirements. Methods of commercial training are presented with particular relation to plans for cooperative part time work.

The conclusions from the two closing chapters on how to train girls and boys for clerical work are that girls should have:

"A maximum of general education combined with specific training in some one line.

"A modicum of training for the development of mental qualities and business standards.

"A minimum of 'background' subjects."

And that boys should have:

"A maximum of general education and of studies which make for the development of mental qualities and business standards.

"A modicum of 'background' and cultural education.

"A minimum of specific training."

RAILROAD AND STREET TRANSPORTATION.

RALPH D. FLEMING.

This section of the report claims attention and interest on the ground that such a survey has not been made before in this country. The subject is developed in three parts—railroad, motor and wagon, and street railroad transportation. Figures are overwhelming. "Railroad trans-

portation in the United States employs one man among each sixteen between the ages of 21 and 45 engaged in gainful occupations . . . ." In Cleveland alone, 4,500 men are employed in the transportation end of railroad work, upwards of 10,000 men in street transportation and 2,500 in street railroad transportation.

Under railroad transportation, the report deals in greater or less detail with the requirements for entrance, promotion in service, steadiness of employment, methods of discipline, duties of service, union organization, accidents, age and nativity, wages, the problem of training, how the railroads train workers, and the contribution of the public schools.

Railroad employment, especially in the higher positions which are recruited by promotion from below, requires a rather exceptional type of person, both physically and mentally, and employes are received only upon rigid examinations which are continued periodically as advancement is made. Educational preparation which can be given outside of employment is slight. A thoro grounding in the essentials is recommended, particularly in reading, arithmetic and elementary science, with emphasis upon their relation to everyday life and problems. Trade knowledge must come thru participation in the work, and the organization of railroads for this training is adequate. There is call for serious consideration by school authorities of the problem of supplementary training for those who have entered this industry.

The analyses of motor and wagon, and street railroad transportation follow much the same lines as that of railroad transportation. In each, the requirements are the fundamentals of education concretely presented, and in each, trade knowledge must be acquired in the work. An elective course in automobile construction and operation is recommended for the technical high schools, including actual practice in repair work. The report is illustrated and supplemented by adequate tables and diagrams.

THE BUILDING TRADES.

FRANK L. SHAW.

The subject of this section of the report is very closely related to manual training and vocational work for boys, and will therefore be of particular interest to workers in industrial education.

The early chapters speak briefly of the development of the building industry; analyze the various allied trades involved, and the changing conditions in these trades; and discuss the number of workers and the

sources of supply, conditions of apprenticeship, relations of organization, condition of labor as to earnings, rates of pay, hours, regularity of employment, health conditions and accident risks, and opportunities for advancement.

About 30,000 men in Cleveland are engaged in the building industry, and the various enumerative and comparative tables and diagrams concerning their activities are of value because of their general application. Unlike many other vocations, the building trades are not local in character, having everywhere a somewhat definite relation to population.

Statistics show that school training for building trades, to be effective, must begin as low as the seventh grade. That such training can be given in the elementary schools as now organized, is doubtful, as the percentage of those in the present grammar school, who would directly benefit, is too small to justify differentiation of courses essential to special training. In the junior high school, where numbers are larger, a general industrial course is recommended which will, thru electives, give opportunities to boys intending to enter a technical high school, or directly into industrial work. Such a course must be general in character, applying to the needs of many trades. This general course should include industrial arithmetic, industrial drawing, elementary science relating to industry, and courses in industrial information and shopwork. These courses should be prominent features of the junior high school, as being of value to all future industrial workers, and should have some adaptation to the building trades. The scope of these courses is somewhat developed.

In addition to the general course, a two-year vocational course is recommended to fill the gap between the end of the compulsory school age and the entering upon a trade. Such a course might be given in the technical high schools, but better in a separate vocational school. This special need is to be fully discussed in a later section of the report.

In a discussion of training after leaving school, there is shown the necessity, under present trade conditions, for supplementary instruction. The attitude of unions toward such instruction, the service of the technical night schools, dull season apprentice classes, and classes for journeymen and helpers are included.

Briefly stated the report recommends to school officials, as a basis for the preparation of future workers, a study of city industries; and that the schools assume responsibility for mental development related to industry, leaving to industry itself the burden of skill.

These three sections will be of value to vocational guidance workers.

EDITORIAL COMMENT

IT is a good thing to get the other fellow's point of view once in a while. For instance, we are quick to agree that boys and girls leaving our schools should be paid a living wage. Francis Kilduff, ex-president of the Illinois Retail Merchants Association, said at the recent meeting in Chicago, "How can we be expected to pay a living wage when the pupils come from the school without ability to do anything well?" This is a fair question, and the school should meet it squarely. We should so conduct our school work that the children cannot go out with our approval or recommendation until they do know how to do something well. They should have power to give service that has a commercial value. The school ought to be able to teach the correct use of a yard stick, how to write legibly, the addition of simple fractions, how to write a simple business letter, how to spell, and to be courteous to a customer. It should do these and much more, and should know whether it has accomplished its purpose or not before it gives the recommendation. Doing these need not interfere with giving a wider outlook upon life and greater capacity to enjoy life.

ANOTHER speaker at this same convention enumerated some of the things which, from the business man's standpoint, the school can and should teach. One of these was loyalty to one's superior officers. He did not refer to loyalty in general, but to that kind of loyalty that results in cheerful obedience. He stated that the native Germans are being promoted faster in American commercial houses than native-born Americans because they have been taught to do as they were told. They are loyal to their superior officers.

A second thing that the schools should teach according to the same speaker is a right attitude toward compensation. He recommended that the prospective worker be taught that he must give freely of his effort because in doing so he will develop power, and ultimately will receive compensation. A beginner too often over-estimates his commercial value, and he forgets that he must usually earn his increased salary before he gets it. He also forgets the weeks when he didn't earn more than a small fraction of the salary being paid to him, though he may have worked tremendously hard all the time.

A third quality suggested for the school to teach was deportment. Boys and girls are too often found careless or lacking in good manners, and in their consideration of other people.

Is there any reason why the school cannot reasonably be expected to develop these fundamental business qualities and know whether they have done so?

A complaint against the graduates of our schools who have taken handwork is that they do not distinguish between crude efforts and the results of skilled craftsmanship. We are not sure to what extent this is true. In the higher realms of artistic handcraft, especially, it must be true because students have little or no opportunity to study fine examples of craftsmanship. Oh for an industrial art museum in every city, and a great circulating museum in every state, sending out its exhibits to every high school and every center where artistic handicraft is undertaken!

And then give us teachers who are artist-craftsmen! Let them do beautiful pieces of handwork because they love to do it, and because the doing of it will be an inspiration to the students in their classes, and because it will increase the industrial art ability of the nation. Let's form guilds of teachers who will agree to make one beautiful piece of handwork every year and submit it for exhibition. Such a guild might well be formed within the Western Drawing and Manual Training Association or the Eastern Arts Association, and the exhibition of its work form a department of the annual exhibition of the Association. Why not?

AKIN to this idea of developing discrimination between the crude and the fine in craftsmanship is the belief that the school work would be enriched if there were some "commercialism" in connection with the school work. For example, Miss Blanchar, principal of the Milwaukee School of Trades for Girls, believes that a girl takes more pride in the dress and hat she makes if she knows that some one is going to wear it. She says, too, that there is educational value in having customers come to the school. She thinks that "it is a good thing for a girl to find out how fussy a customer can be about a piece of work she is going to pay for." Any experience that brings strongly before the pupil's mind a high commercial standard, which should also be a high artistic standard, is a help in accomplishing one of the great aims in teaching handwork in schools. The process of making a hat or an up-

holstered chair or an inlaid desk up to the highest commercial standard in quality is no less cultural than when it reaches a much lower standard. Indeed, it is more cultural, and certainly far more practical. This does not mean that every child will reach this goal all the time, but it does mean that the goal should be nothing lower than a commercial standard.

ONE of the many fine things that have been said by Mrs. Lucinda W. Prince in her recent tour thru the cities of the Middle West was that in the city of Boston, the instructor in salesmanship in the high schools, and the practice experience in the stores had raised the ban from the sales girls in that city. Before such classes were started office girls were considered as being on a higher social plane than sales girls. Now the attitude has completely changed and the high school classes in salesmanship have done it. The fact is that the sales girl's job has been raised to a skilled trade. When a trade is analyzed and the principles taught it becomes a skilled trade, and even tends to becoming a profession. We long to see the day when many other occupations will undergo the same evolution that has begun in that of sales girls. Can you satisfy your ideal of democracy in any other way?

BILLS FOR FEDERAL AID TO VOCATIONAL EDUCATION.

THE question of federal aid for vocational education continues to excite popular interest, tho the status of proposed measures in Congress is not easy to determine. Bills have been reported upon favorably by both the Senate Committee on Education and Labor, and the House Committee on Education, and they are now awaiting opportunity for consideration. The two bills are not precisely the same, but follow in a general way the provisions of the measure recommended two years ago by the Commission on Federal Aid to Vocational Education.

It will be recalled that President Wilson emphasized the need of federal appropriations in aid of a national program of vocational education in his message at the opening of Congress, as well as in subsequent addresses. The sentiment in Congress at the time this is written appears to be quite favorable to the measure, and many forces are at work in the effort to bring about the desired action. Indeed, it is doubtful if there ever was a more significant combination of influences and popular approval behind a piece of educational legislation in the history of Congress, than seems to be true in the case of the Smith-Hughes bill.

Among the powerful national organizations which have been active in the propaganda are the National Society for the Promotion of Industrial Education, the National Education Association, the American Home Economics Association, the American Federation of Labor, and the Chamber of Commerce of the United States. The Chamber of Commerce has recently submitted to its members a referendum on the question of federal aid for vocational education. This is the fourteenth referendum relating to questions of importance and immediate interest to business men, which the National Chamber has sent to its members, and indicates in a rather unique way the degree and quality of interest which has been aroused.

A special committee of the National Chamber has submitted a report which recommends: (1) Liberal federal appropriations for the promotion of vocational education in the United States; (2) That federal appropriations should be allotted among the states upon a uniform basis, and should bear a uniform relation to appropriations made by the states for like purposes; (3) The creation of a federal board, to be representative of the interests vitally concerned, and to be compensated sufficiently to command great ability; (4) That the federal board should be required to appoint advisory committees of five members each, representing industry, commerce, labor, agriculture, homemaking, and general or vocational education.

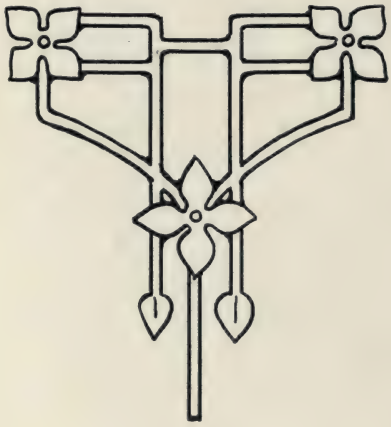
It is the purpose of the referendum sent out by the National Chamber to secure an expression of opinion from members as to the desirability of an extension of governmental activities in the manner proposed. The results of the referendum, when formulated, will represent much more than a collection of opinions of individual citizens, important as that will be in this instance. Behind any pronouncement that may be made will be the weight of many influential organizations, since the affiliations of the National Chamber include the leading national organizations as well as local trade bodies in every state.

The report of the committee emphasizes one point that has been lost sight of occasionally in current discussions—the kinds of persons for whom it is proposed to provide vocational education. It should be recognized that the federal government is already aiding in a material way, many forms of higher education thru its support of the state universities and land grant colleges. These educational opportunities are supplemented by the work of many other excellent institutions supported by private funds. Still a different type of educational activity is represented by the agricultural extension work, for which the states and the

federal government together expend more than $5,000,000 annually. All of these constitute very definite and valuable vocational education opportunities—for those who are able to utilize them.

The bills now before Congress, however, propose to assist in the education of a clientele quite different from that represented by either of these. It is expressly provided that the education contemplated in this legislation "shall be of less than college grade, and shall be designed to meet the needs of persons over fourteen years of age who are preparing for a trade or industrial pursuit, or who have entered upon the work of a trade or industrial pursuit." In the words of the committee report, "it is in the training of this great body of workers that federal aid is imperatively and immediately necessary."

Without diminishing in any way the opportunities and facilities for the higher forms of education, for those who are able to avail themselves of them, we must in some way make more just and adequate provision for the great army of boys and girls who have been allowed, hitherto, to enter upon the exacting duties, and assume the responsibilties of life while still immature physically, with their intellectual vision circumscribed by a primary school horizon, often completely ignorant of themselves and of the trend of their potential development, without proper ideals and ambition, and without even a real understanding of the meaning of life itself. What to do for these boys and girls is undoubtedly the next great educational problem to be solved by the thinking people of America. —W. T. B.



OF CURRENT INTEREST

VOCATIONAL EDUCATION ASSOCIATION OF THE MIDDLE WEST.

ON March 30th and 31st, and April 1st the second annual convention of the Vocational Education Association of the Middle West was held at Hotel LaSalle, in Chicago. All the sessions except one, which was held at the Art Institute, were in the grand ball room of the hotel or in the nearby "red room." The attendance was large—larger than expected. At the first session held on Thursday afternoon, the porter who provided the extra chairs, stated that there were approximately 1,050 persons in the room. Credit is due very largely to William J. Bogan for the excellent program, and to Professor Frank M. Leavitt, the president, for his successful efforts during the convention to have everything carried forward successfully.

THE GARY SYSTEM IN NEW YORK.

The first session was devoted to a discussion of the Gary System. The speakers were Assistant Superintendent G. W. Swartz of Gary, who described the system; Principal William E. Grady, of New York City, who compared the Gary and the Ettinger systems of New York City; and G. E. Wulfing, director of industrial education in Gary, who spoke of the Gary system in relation to vocational education.

Of these three addresses interest easily centered on that by Mr. Grady who pointed out the defects of the Gary system from the viewpoint of a New York schoolman. He wanted the audience to understand that he was not criticising the Gary system in Gary, but the Gary system as it had been forced into New York City by politicians; and put into operation under conditions wholly different from those in Gary, and as he seemed to believe, largely unsuited to the system. He wished to make it clear also that he was in favor of some scheme—Gary or Ettinger or otherwise, which would provide "less bookish work than is now there" and "more occupational work, more constructive work." He then related the events leading up to the experiments with the Gary system. He referred to Mayor Mitchell's ambition to have a scheme of industrial education as one of the results of his administration of city affairs. He referred to the pilgrimage of the mayor, President Churchill of the Board of Education and other officials, to Cincin-

nati and Gary. He spoke of the subsequent engagement of Dean Schneider and Superinendent Wirt by New York City. Before Superintendent Wirt has been engaged, however, two plans for reorganizing the New York schools were presented to the Board of Education, one of which is now known as the Ettinger plan. This was started before Superintendent Wirt came to New York. After he had looked it over, he felt that he could not stand sponser for it, because in many respects which he considered vital, it was not in harmony with his ideas. His own scheme was then put into two schools. Thus the competition between systems arose.

The following excerpts from the stenographic report of Mr. Grady's address contain some of its most significant passages:

> Now, those of us who have been criticising or opposing the Gary plan in New York City are simply taking the attitude that the mayor and comptroller who, in the interests of economy, are interested in spreading the plan city wide, are wrong in that they do not take a judicial attitude and say, "Wait till we see what the outcome of the demonstration will be." In September, last, the comptroller of the city and the mayor, neither one of whom legally have any right to interfere in matters educational (but whose advisor is Mr. Wirt, and a member of their educational committee) stood for the complete reorganization of the school system on the basis of this interesting, but relatively novel and untried plan of school organization.
>
> Now, in my opinion we would be recreant to our duty to the children of New York City if we did not stand up and say, "You are adopting a procedure that is neither scientific nor proper in any sense at all. You may experiment with pig iron, but you should not experiment with human personality unless you are dead sure that your experiment is the best kind that can be devised."
>
> We have been facing a propaganda that in my opinion is most remarkable, due to well-intentioned people who see in Supt. Wirt's scheme as outlined by his system, a panacea for ills of all kinds, educational and social. It may be that the day will come when some scheme of that kind will be devised, but until we are certain that there is a reasonable chance that it will effect the values that are claimed for it, we say, "Pause, pause, give this man every opportunity on a large scale to make the demonstration, but until that demonstration has been made, and has satisfied—not propagandists, not people with a pecuniary interest in it, not newspapers, publists, not orators, not rostrum lecturers, but professional educators, together with parents—until the scheme has satisfied people of that kind, let it remain a matter to be handled by professional experts and not by politicians."

While Mr. Grady did not wish his statements to be regarded as final on the subject, he gave emphasis to the following points: (a) That the scheme is unsuitable for application in New York according to Mr. Wirt's own plans and statements. He cited cases in which Mr.

Wirt had been obliged to modify plans to such an extent as to make them essentially different from the original. (b) That the children in the "X School" and the "Y School" are not getting an equal opportunity because the morning hours are more valuable than the afternoon hours. (c) That economy of teaching force is not as great as claimed at first.

Concerning the vocational training feature of the scheme Mr. Grady said:

> Now, I cannot see in Mr. Wirt's plan of prevocational training for the mature children anything but a return to the casual, unorganized neighborhood experiences that formerly did exist, but which the development of cities has wiped out and that is not in any way commensurate with the type of sequential organized industrial training which the experience of this whole country says is the best way in which to supply what has dropped out of the child's life.

Concerning the duplicate school scheme he said:

> I think any duplicate school plan, whether it is the Gary plan or the Ettinger plan or the double platoon plan—I think any duplicate school plan should not be a permanent plan, and I do not believe that the people of this country are going to adopt a scheme simply because it is economical, unless you can prove that you can serve all the best things that we have in our present single unit type of organization. (Applause.)

Mr. Grady fears that Mr. Wirt is arguing from the equipment to the child instead of from the child to the equipment, and that in the New York agitation, the dollar is being put above the child.

EDUCATION CHANGING FROM INDIVIDUAL TO SOCIAL.

The second session of the convention was the banquet on Thursday evening, when the speakers were Dr. Charles A. Prosser of Minneapolis, Victor A. Olander, secretary-treasurer of the Illinois State Federation of Labor, and Superintendent John D. Shoop of Chicago. Perhaps the keynote of the session was sounded by Dr. Prosser when he said that up to the end of the nineteenth century all education was for the individual; after that it began to be social. We are now trying to work out a new program in harmony with the social ideals. This cannot be done without the cooperation of all the factors concerned in education. It cannot be done if the schoolmaster stands as a dog in the manger. It cannot be done if the manufacturer persists in holding to a narrow selfish view. It cannot be done without the support of organized labor.

In speaking for labor Mr. Olander said, "We of organized labor

welcome the coming of vocational education because we know that you will have to look into the workshop, and if you do you will find some knotty problems." It was evident that among the problems Mr. Olander had in mind was that of the monotony of machine work and the deadening effect of the factory system as employed in some industries. He would welcome vocational education because he believed that it would bring such conditions to public attention, and would reveal the fact that no training for jobs under such conditions should be given in the schools; but rather that the training should be to help men out of such jobs or to change the character of the jobs.

A fine program on "Work for Women" was presented on Friday afternoon. Department store education was discussed by Miss Reid of Marshall Field & Co., of Chicago, and by Mrs. Prince of Boston; home economics as vocational training was the subject presented by Miss Marlatt of the University of Wisconsin; design by Miss Bonnie Snow of New York, and Miss Emma Church of Chicago; and the commercial products of girls' schools by Miss Ora Blancher of the Milwaukee School of Trades for Girls.

On Saturday morning there was a strong program on "School and Employment." The leading speakers were Alfred P. Fletcher of Rochester, N. Y., who spoke on vocational guidance; George H. Miller, of Sears, Roebuck & Co., on the selection of competent employes; and James O. Craig of the Business Men's Clearing House, Chicago, and Charles J. Boyd, general superintendent of the Illinois Free Employment Offices, who spoke from the view-point of the employment agency.

THE VITAL IMPORTANCE OF AGRICULTURAL EDUCATION.

An important feature of the convention was the three sessions devoted to agricultural education. Among the speakers at these were C. H. Lane, specialist in agricultural education for the U. S. Department of Agriculture, Washington, D. C., Albert H. Leake, inspector of manual training and household science, Ontario, Canada, Dr. Eugene Davenport, of the University of Illinois, Professor G. I. Christie, superintendent of the department of agricultural extension at Purdue University, and Professor Perry G. Holden, special agent for the International Harvester Co.

One listening to the addresses in the meetings devoted to agricultural education could not fail to realize some of the fundamental economic problems now before the nation. Prof. Christie said, "We are not so

much interested in the farmer as we are in the fact that farms provide us food. We've sent people to bed hungry this past winter. This is our problem: How is the poor man to get three meals a day at a price that he can pay? The only way is to make those two blades of grass grow where one grew before."

Mr. Lane gave figures showing the large sum of money that is now being spent by the Federal Government and the several states in the work of secondary agricultural education. He gave many facts concerning the movable schools of agriculture, and their effect in stimulating agricultural instruction in the regular schools. He said that seventeen states now have special agricultural schools, tho Illinois has none. Minnesota was the first; now there are 115 such schools in the nation. Referring to agricultural departments in public high schools, Mr. Lane said that Minnesota now has 177, and that in these departments fifty per cent of the teachers' time is spent in teaching agriculture in associated rural schools. Kansas has 188 departments of agriculture in high schools, each receiving state aid. He gave figures for other states, also, and then closed with suggestions for Illinois. He recommended agricultural schools providing two-year courses for farmers, and training courses for teachers for the rural schools. In this connection he quoted Superintendent Blair's statistics showing that there are 1,740 teachers in one-room schools in Illinois who have never had more than an elementary school education, 1,272 who have had no more than a high-school education, and 3,102 who have never had any professional training. Mr. Lane recommended state aid for agricultural education, the employment of a good supervisor of agricultural education for the state department of public instruction, and a professor of agricultural education by the state university.

BETTER AGRICULTURE.

Dean Davenport asked the question: "What do we have in mind when we talk about a better agriculture?" Then he answered his own question: "It means business or it means nothing." There are four central thoughts around which these ideas about better agriculture cluster—four that we ought to keep in mind.

First. More profitable farming. Farms must pay better than ever before. The man who owns a farm now did not pay for it: its value is an "unearned increment" due to the rise in land value." I do not believe that farms have ever yet earned enough to pay for the labor the farmer has put on the land and the fertility he has taken off!

"Tom owns a farm he inherited. His father was a poor farmer; he is a poor farmer. He can't make any money at farming, but he can sell his land at $200 an acre or he can mortgage it at from $75 to $100 an acre and buy automobiles, go to Europe, etc. But this is no credit to Tom or his farming."

Second. "We must make farming permanent. We must treat this land so that it will be handed on to our children in just as good condition as it is today." In some places it is already too late to do this, because you can't raise on the land $2 an acre, the amount necessary to purchase the lime to restore the soil.

Third. One-third of the people live on the land. "If they are to be competent farmers they must be comfortable or you will have an American peasantry instead of an American citizenship." The farmer and the farmer's wife must have the comforts and conveniences of modern country life.

Fourth. The farmer must realize something of the beauty in the open country. He must add the beauty element to his farming. He must do planting about the place, along the roadside, along the railroad —just for the sake of beauty. It takes thought, but it gives joy, and makes the farm more than a place to labor and to eat.

The last program of the convention, held on Saturday afternoon, was devoted to a discussion of "Principles and Methods of Differentiation at the Seventh Grade." Among the speakers were Ernest P. Wiles of Evansville, Indiana, Paul C. Stetson of Grand Rapids, Albert W. Evans and Miss Edith Brown of Chicago. Many advantages of the junior high school and many details of organization and method were brought out in this meeting.

The convention closed with a brief business session in which Albert G. Bauersfeld, the secretary, presented encouraging facts concerning the financial condition of the Association. The officers elected for the coming year were: George H. Miller of Sears, Roebuck & Co., Chicago, president; Paul C. Stetson, principal of South High School, Grand Rapids, Mich., vice-president; Albert G. Bauersfeld, instructor at the Lane Technical High School, Chicago, secretary; and Miss C. H. Smith of the L. C. Smith Typewriter Co., Chicago, treasurer.

Speaking of this convention a week after it closed, a teacher of long experience in grade and high-school work said, "The meeting was refreshing and stimulating. The narrow type of schoolman was not in evidence at all. Thruout the entire meeting one was constantly viewing school work from a different angle. It was very helpful."

GARY PLAN IN THE NEWARK SCHOOLS.

A system of alternating classes with a varied program of shopwork, was introduced in two of the Newark, N. J., schools on November 1, 1915. For several years, the Cleveland School under the principal, Edgar S. Pitkin, had made partial use of the Gary plan, using classroom, auditorium, shop and gymnasium alternately. The Cleveland was, therefore, chosen as one of the schools to work out the new experiment. This school, a modern, fireproof building, has gymnasium, auditorium and roof playgrounds, but no other playground out of doors. It was constructed to accommodate 35 classes and a kindergarten. At present 46 classes are being held in the building, and there is room for 6 more. The school day has been lengthened to 6 hours and 10 minutes in the grammar department, and to 4 hours and 50 minutes in the primary department.

The school is divided for purposes of program making and administration into two divisions called X and Y schools. Each division is complete, containing all grades from 1B thru 8B. The school hours for the X school are 8:30 to 11:10 a. m. and 12:20 to 3:45 p. m. For the Y school they are 8:30 to 12 and 1:10 to 3:45. The lunch period for pupils is 1 hour and 10 minutes.

The X school occupies the academic classrooms and is engaged in regular academic classroom work from 8:30 to 9:50 and from 12:20 to 2:30. The Y school during those hours is divided among play activities, shopwork and out-of-school groups. From 9:50 to 12 and from 2:30 to 3:45 the Y school is doing the regular academic work, and the X school is divided among play activities, shop or special activities, auditorium or out-of-school groups. Of the 24 classes in grades I to IV, one-fourth are always out of school.

The shop and special activities in the school are drawing, sewing, millinery, domestic science, elementary science, practical electricity, printing and shopwork.

All pupils of grades V to VIII are in a special activity class 80 minutes per day. At the end of 10 weeks the group changes to another activity. An exception is in printing where the group is given 20 weeks' continuous work. One classroom has been fitted up as a library, and all pupils of grades IV to VIII have one period a week in this.

NOT MILITARISM BUT VOCATIONAL EDUCATION NEEDED.

An article in *American Education* for March, 1916, by Frederick N. Roman, professor of Economics at Syracuse University begins:

It has been a great revelation to me, indeed, to see the extraordinary enthusiasm that the teachers have shown for military preparedness. That even the teachers should throw away their ideals, and join in a reversal of the country-old policy of the United States cannot be viewed in any other light than an alarming catastrophe in education.

Mr. Roman goes on to give reasons for this decided view of the matter. He says, first, that the teacher who advocates military preparedness is upholding one standard in the classroom, and its opposite outside. For modern educators hold the view that while the amount of physical matter in the world is fixed, the amount of brain matter is increasing; that the advance of civilization, therefore, should bring an ever greater control of mind over matter. Because of this belief, teachers now rely in the schoolroom upon reason, justice, kindness, persuasion—not upon force. Why then, advocate a doctrine of force in the outside world?

Next, this policy of militarism, disguised as "preparedness" as advocated, is subversive of liberties guaranteed us under our constitution. It is admitted that it is now difficult to get enough volunteers to keep the army at its present size. It is proposed, by such bodies as the Security League, that we, therefore, have conscription. And many of the members of this league are those very financiers who contended before the Monetary Commission that it would be "un-American" to *compel* national banks to become members of the federal reserve system; that this system should be made so attractive that the banks would gladly enter of their own accord. Why not make army life so attractive that men will be glad to come into it? Why not prepare the men in our army for industrial success as well as for war?

In the third place, we already have such things as forts and naval stations, no longer of any real service to the country, the abolition of which has been recommend by nearly every Secretary of War since 1865. Such things are kept because the congressmen need this money for their districts. Why appropriate more money when we are already spending extravagant amounts for defenses which do not defend us?

The much discussed efficiency of Germany, moreover, rests this moment more upon her administration and the thoroness of her vocational system than upon her army. Germany is in the midst of a national tragedy. Germany was peacefully conquering the world by her commerce and by her learned men when her militarists, always too dominant, felt compelled to show the people some result for the burdensome taxes they were paying to support the army. Hence the "bombast that is making the Kaiser and the Germans ridiculous at the present time."

Germany's strength lies in the fact that she has handled the questions of poverty, illiteracy, industrial education, sanitary conditions, unemployment, industrial insurance, vagabondage in a way that leads to an efficiency that has never been realized by any country in the world, and this applies especially to her technical schools. This is a sort of preparedness in which we might well imitate Germany. This is a military preparedness that will satisfy the most fearful and it will give us the best part of present day Germany's preparation for war and at the same time, aid in letting the military spirit die out.

Lastly, we ought greatly to fear a doctrine which is bold enough to teach "Bombs and dollars are the only things that count today. We have plenty of one. Let us lay in a good supply of the other and blast a path to world leadership as soon as an opportunity presents itself."

On the contrary in place of military preparedness let us have industrial preparedness. Let us prove to our young men that the liberties and opportunities they enjoy are well worth preserving for their children. We shall not need conscription then. Let our teachers think twice before they subscribe to this bomb-and-dollar doctrine of the militarists.

THE TEACHERS' NEED OF PRACTICAL EXPERIENCE.

The article by H. Williams Smith of London, published in our December number has brought forth a very interesting letter from William A. Carter, of Richmond Hill, New York City. He expresses his appreciation of Mr. Smith's article and emphasizes its contention by saying that the manual training teacher should keep himself in touch with the actual shopwork of his trade, and avoid the pitfalls of academic theory and pedagogy. Mr. Carter thinks that the ordinary teacher of manual training devotes entirely too little time to original work of an experimental and constructive character. He thinks the instructor should work with his own hands, not only in wood but in other materials as well, and that work of this kind, done by the instructor, would be of great benefit to himself and to his pupils.

Mr. Carter's first suggestion is that each teacher of manual training be required to work out each year, in the school shop, some problem more or less directly connected with work his pupils are doing. One year, he thinks the teacher might construct a chair, a table, a desk, or some article of furniture, thus displaying his knowledge of general construction work and his skill in the use of tools. The next year, the thing constructed might be in cement, a plant box, a garden seat, or possibly

a miniature wall, tunnel, or even a house. The problem, a third year, might be in mechanics, a miniature steam engine, an electric motor, or an electric medical battery. Later the articles made might be in tooled leather, in cooper, or brass. The finished models, constructed by all the teachers of the state, might be put on exhibition each year, and an award made for the most original and best made piece.

Mr. Carter suggests that the teacher construct his article slowly, and as much as possible, before the eyes of the boys in the shops, that they may have an opportunity to see the thing grow. He believes that the teacher, himself, should use the same methods he requires the pupils to use. They should see that the teacher puts his best efforts into the work, that he make every joint as perfect as it is possible for him to make it. They should see the good workmanship and the beauty of the finished object. Thus the teacher will gain their respect, proving that he can do, in finished style, what he asks them to attempt.

Next, Mr. Carter goes on to suggest that every manual training teacher, whether or not he has had practical experience, be required, one year in every six to ten, to enter an industrial shop and spend from six to eight months putting up houses, making patterns, running a machine—in short, coming into close personal contact with shop conditions and practice. Such an experience, if we are to believe Mr. Carter, would benefit the teacher mentally, and physically, and send him back to his school with renewed energy, a broader outlook and more respect for honest toil.

Mr. Carter says that he, himself, had many years of practical experience before he began to teach. He adds that he has been teaching only eight years, and yet, for two years past he has been feeling the need of getting back to the shop as a cure for too much theory. How much more, he exclaims, must this need exist, even though it be not so much felt, in the case of a manual training instructor, trained only in college! In the countries of the old world, shop teachers are often kept in practice by employing them only part of the year, and always by encouraging them to engage, as much as possible, in practical work.

In conclusion, Mr. Carter believes that the instructor devoting six months to actual working at his trade should not be allowed to suffer financially. Difficulties of this kind, he thinks could be adjusted by some such plan is this: Let the city pay to the man the difference between what his salary as a teacher would be and the wages he receives as a workman.

HOLYOKE EVENING VOCATIONAL SCHOOL.

We have received the following information from Wm. H. Whitney, director of vocational education in Holyoke, Massachusetts:

The Holyoke Evening Vocational School, the purpose of which is to give extension work along trade lines to men employed during the day in mechanics and industry, has opened a new department for textile workers. This department began at the request of employes themselves, the local branch of the United Textile Workers of America. The school is controlled by a local board of trustees for vocational education, and the Massachusetts State Board of Education.

It is impossible for the worker to get, during the day, the thorogoing knowledge of operations and processes which he is seeking in the evening school. While working, the producer is constantly meeting new problems that take time to solve. But his business is production. It is a matter of dollars and cents to him, as to his employer, to get over a difficulty as quickly as possible, and get his machine or his work into running condition. He has no time to think beyond the immediate hitch back to the prime cause of his trouble. The tendency, therefore, is for him to indulge in patch-work and leave the real correction to a later date. In the evening class the worker can and does study difficulties back to their prime causes.

The first class to be established was a class for loom fixers who had been for some time in the trade. Meetings were held from Dec. 13, 1915, to March 17, 1916. Practical instruction was furnished in weave formation and cloth analysis. Since a great deal of individual instruction was necessary, this class was limited to twelve men. Twenty-one men had applied, so that nine had to be left on the waiting list.

A second group of thirty-two men, also employed as loom fixers, applied for instruction in practical work on looms. The difficulty here was that rather expensive equipment was required. But as matters turned out, this was really an advantage. For after the board of trustees had secured a vacant room in the basement of the high school for the work, and had signified its willingness to provide instruction, the local textile manufacturers became interested, and loaned or donated several pieces of equipment. The Lyman Mills furnished two Whitin looms, William Skinner and Sons two Stafford looms. The Farr-Alpaca Company provided two Hatterslea looms, and the Springfield Blanket Company donated a woolen loom. All these were installed after working hours, by men interested in the organization of the class.

The overhead works were installed by students in the day vocational school from the departments of carpentry, machine shop practice, and millwright work.

It is worthy of note that all this work was initiated by employes anxious to improve their skill and render more efficient service.

"Holyoke, and especially the Board of Trustees for Vocational Education, should be congratulated on being able to foster and develop, in conjunction with manufacturing and labor interests, this sort of civic pride in the welfare of its industrial and economic life. There is something more than the development of technical skill in movements of this kind. The industrial intelligence of the working man is being developed, his civic pride is being stimulated, and the result will be a type of character so much needed in the industrial life of the community."

SAVED THE SCHOOL BOARD ONE HUNDRED DOLLARS.

The accompanying illustration comes from Edmund W. Kempster, supervisor of manual training at Dover, N. H. The following is the story which came with the picture:

Just outside the city of Dover, New Hampshire, we have two or three ungraded schools which are sometimes used for social as well as educational purposes. These buildings are old and their equipment much worn. Last fall it was decided to replace the desks and chairs in one of these schools by furniture that could be moved to one side when necessary.

To purchase new equipment seemed a financial impossibility, so the pupils of the mechanic arts department of the high school were assigned this work. Old discarded desks and chairs, of the cast iron leg variety, that had been stored away for years, were used for stock as far as possible. The desks were taken apart and the pieces to be used were scraped and cleaned. This took nearly a month, for the tops were defaced with grooves, initials and holes, the work of destructive youth. Some of the tops came apart and had to be reglued. The holes were plugged up; as large as one-inch plugs being used in some cases. The chairs were also scraped and sandpapered.

The freshmen class was given the problem of making the desks, the sophomores of making the chairs. The desks were in four heights: four were 22″ high, eight 24″, four 26″, and four 30″ high. The chairs were made to suit the heights of the desks.

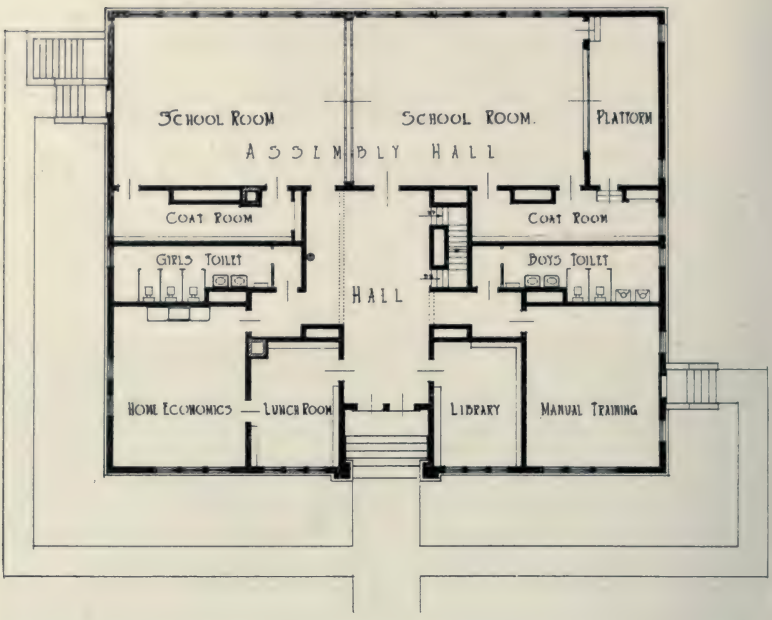
The legs for the desks were cut from oak plank; the sides and bottoms of the old desks were retained for the same purpose in the new project, as far as possible. Sides and legs were mortis-and-tenoned together, cross-pinned with 1″, No. 10, round head screws. The oak was stained to match the tops and sides, which were of cherry, and the desk finished with five coats of shellac.

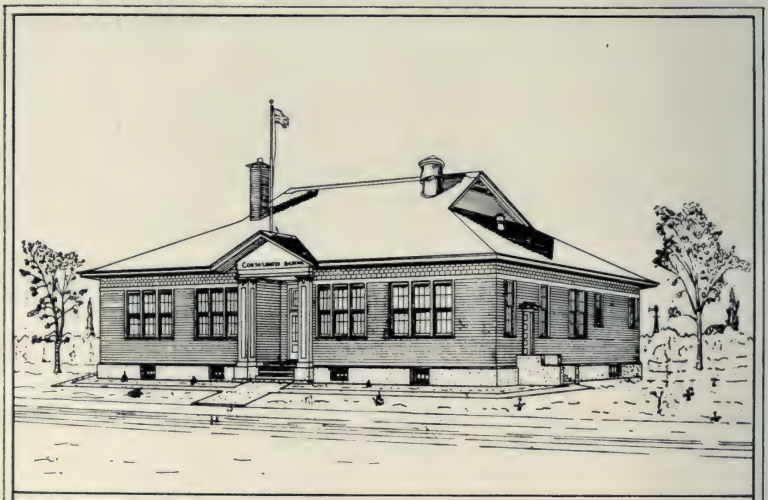
The legs and rounds of the chairs were turned out of birch, and each round was tested to support two hundred pounds to insure strength. The chair was glued together, and at the same time, rods threaded to recive nuts were put in position from leg to leg, diagonally, to prevent the legs spreading. The chairs were stained to match the desks, shellaced, and both rubbed down with pumice and oil.

The project was finished about the middle of January, and saved the city of Dover about $100.



DESKS AND CHAIRS MADE BY THE FRESHMAN AND SOPHOMORE CLASSES OF THE MECHANIC ARTS DEPARTMENT OF THE HIGH SCHOOL IN DOVER, N. H.





MINNESOTA STANDARD SCHOOL PLAN
CONSOLIDATED SCHOOL
DESIGN NO. 13.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

SPEED LATHE, A MACHINE SHOP PROJECT.

It is sometimes a problem to find the right kind of projects for high-school students in machine shop work, when they do not expect to become journeymen machinists. Especially true is this, when boys are but fifteen or sixteen years of age, and have not reached that stage in their thinking when they are glad to make any project merely for the sake of experience gained in making it. George G. Greene of the Lane Technical High School, gives the following essentials for a good project for beginners:

1. Desirability from the boy's standpoint.
2. Simple enough so that it can be made by the average boy in regular allotted time.
3. Not too difficult for a student to make the drawings, patterns and castings as well as do the machine work.

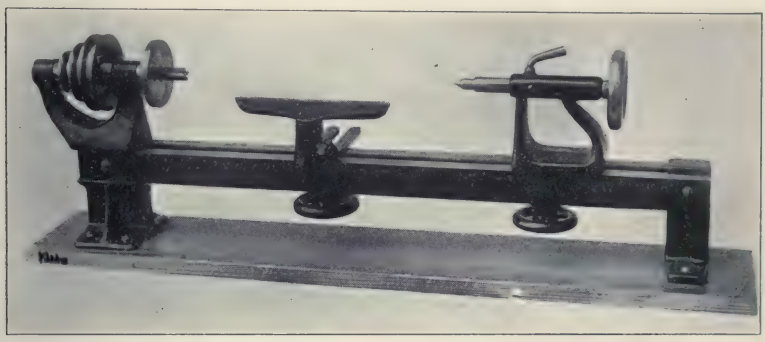


FIG. 1.

Mr. Greene offers the simple lathe shown in the accompanying photograph and drawings, as a project meeting the above requirements. This 7″ speed lathe has a 32″ bed made of 1½″ channel iron, and weighs about twenty-four pounds. It is a light-running machine, operated by foot power or a small motor. The lathe is used for drilling, grinding and turning in soft metal and brass. Fourteen lathes of this type were completed last year. Several boys are now making counter-shafts in order that the lathes may be driven with electric motors.

This project also affords ample material for a course in drawing. It consists of twenty-three different parts which are real objects with which the boys work. It is believed that this is a more desirable method of teaching drawing than the old type of theoretical exercises.

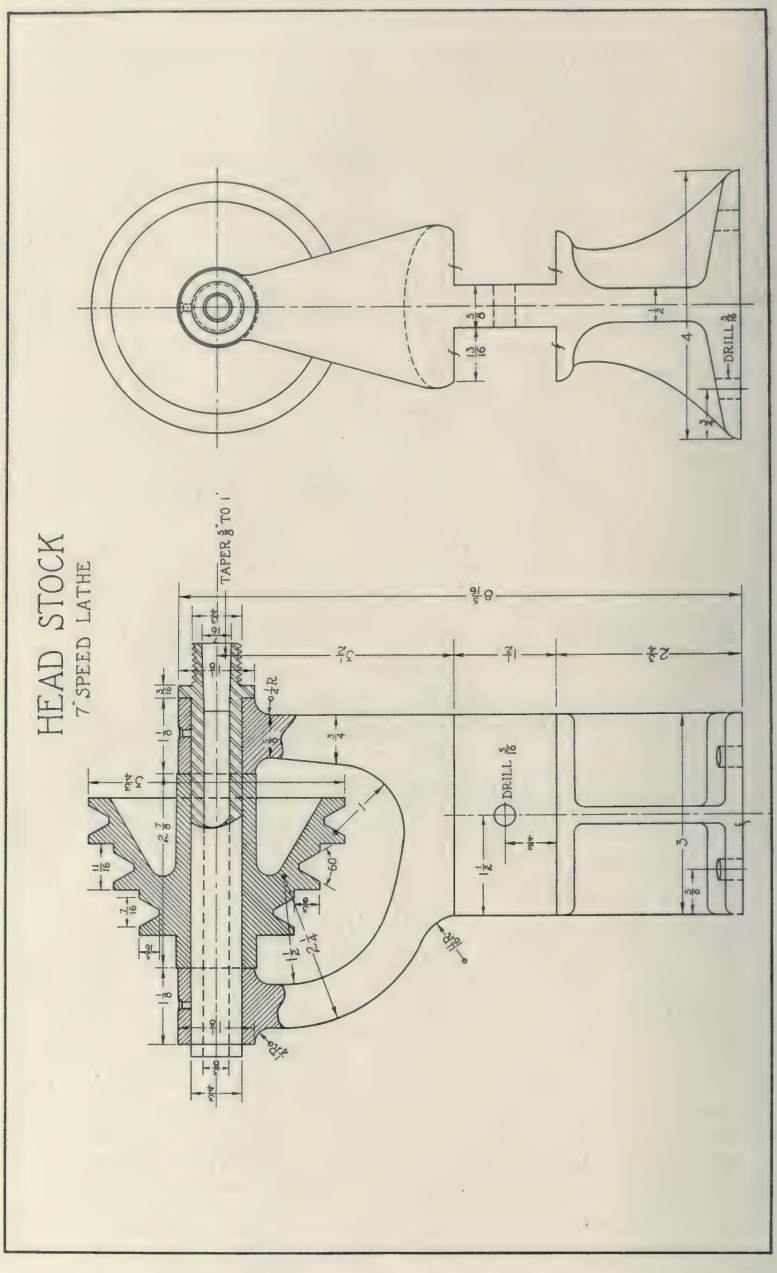

HEAD STOCK
7" SPEED LATHE
TAPER $\frac{3}{8}$" TO 1'
DRILL $\frac{5}{16}$
DRILL $\frac{5}{16}$
60°

FIG. 2.

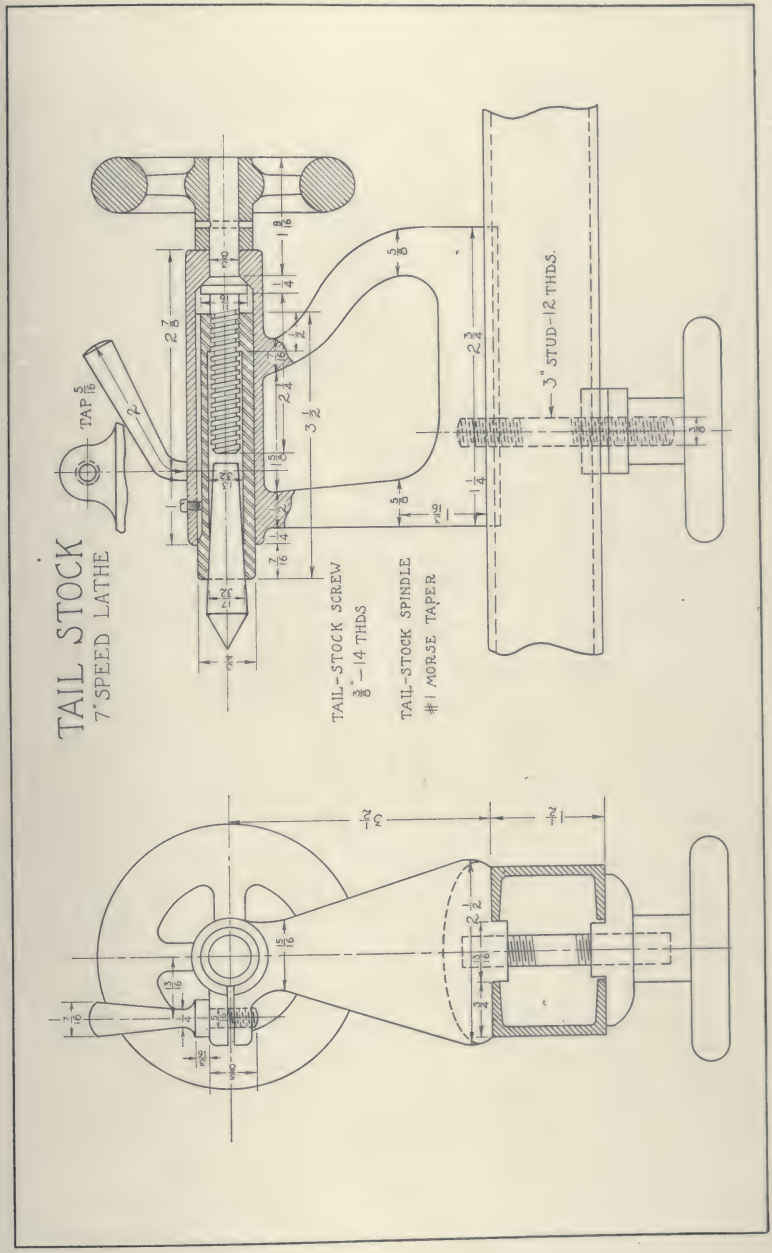

TAIL STOCK
7" SPEED LATHE
TAP 5/16
TAIL-STOCK SCREW
3/8" — 14 THDS
TAIL-STOCK SPINDLE
#1 MORSE TAPER
3" STUD-12 THDS.

FIG. 3.

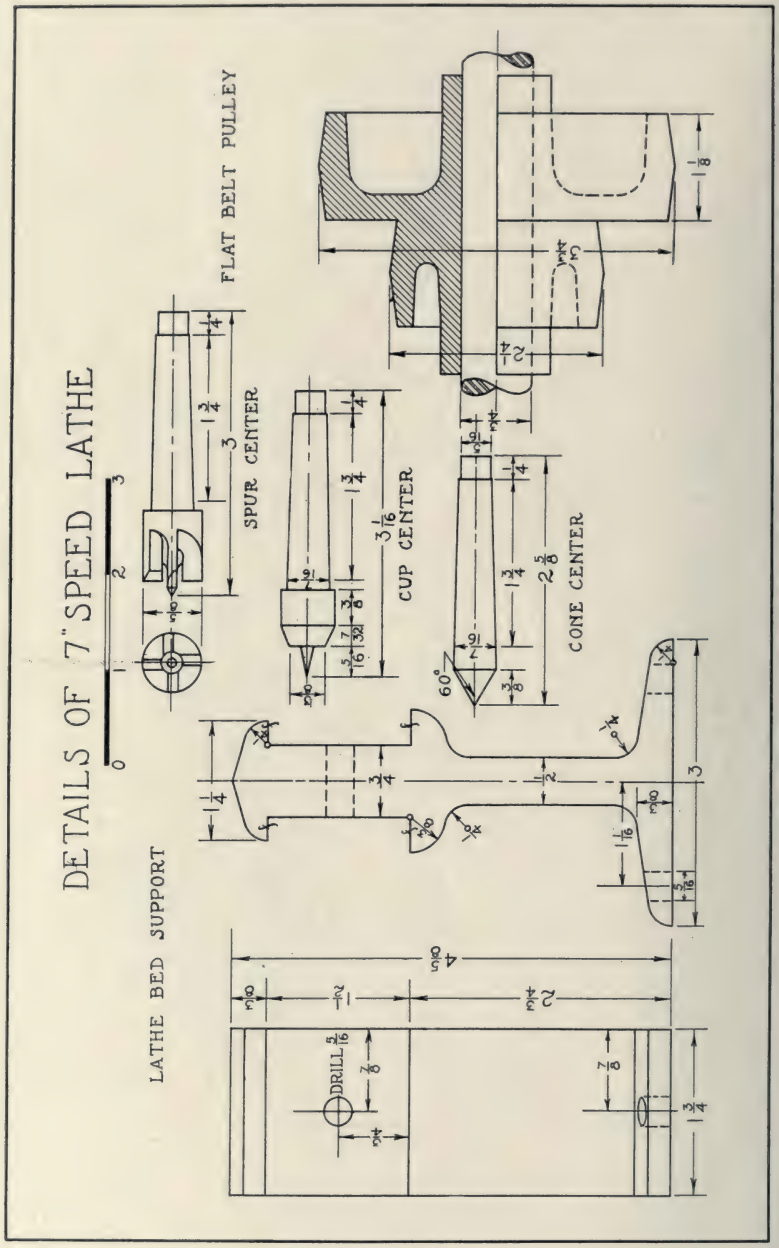

DETAILS OF 7" SPEED LATHE
FLAT BELT PULLEY
SPUR CENTER
CUP CENTER
CONE CENTER
LATHE BED SUPPORT
DRILL 5/16
60°

FIG. 4.

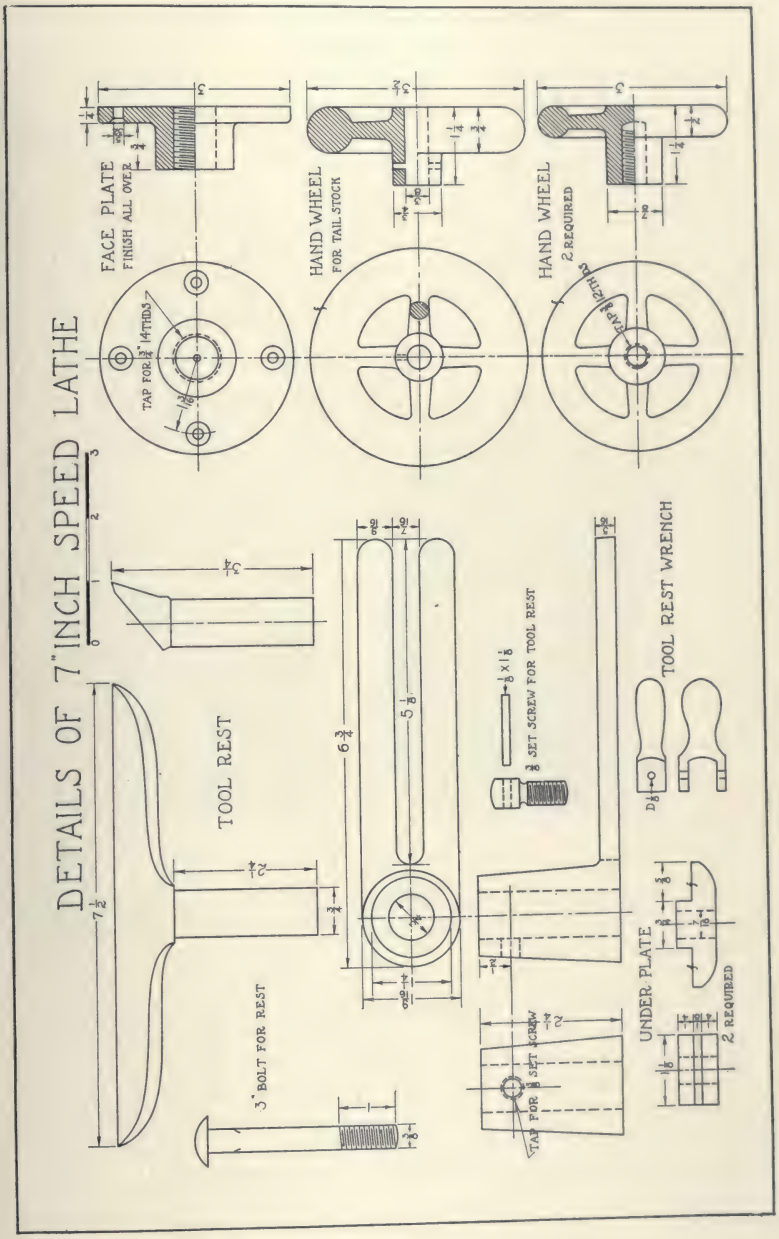

DETAILS OF 7" INCH SPEED LATHE
FACE PLATE
FINISH ALL OVER
TAP FOR 3/8" 14 THDS
HAND WHEEL
FOR TAIL STOCK
HAND WHEEL
2 REQUIRED
TAP FOR 3/8" 14 THDS
TOOL REST
3/8" BOLT FOR REST
3/8 SET SCREW FOR TOOL REST
TOOL REST WRENCH
UNDER PLATE
2 REQUIRED
TAP FOR 3/8 SET SCREW

FIG. 5.

SOME PROBLEMS IN STEAM, IV.[1]

STEAM BOILERS.

The simple steam boiler shown on the left in Fig. 6, and Fig. 7 is the least complex type of boiler with safety valve which it is possible to construct. It is adequate in size and pressure capacity to propel the steam turbines described in the issues of this magazine for March and April, 1915, and the single cylinder engines shown in the December, 1915, number.

The body of the boiler is made of a two-quart kerosene can which may be purchased at the 5 and 10 cent stores for a dime. The can shown is galvanized and has a corrugated spherical upper part. It has safely stood a pressure of 10 pounds when tried out on a steam main. It is wise to test these cans with some known pressure in order to be certain of their breaking strength. This should



FIG. 6.

be done before trying out the safety valve. There is no danger, however, from flying parts. When boilers of this style explode the steam merely escapes thru the resulting tear in the metal.

The safety valve is made of a rod of Venetion iron provided with an adjustable lead weight which can be fastened, by means of a machine screw, anywhere along the length of the rod. The pressure of this lead weight is transferred, by means of a short arm of Venetion iron, to the slot of a ¼″ round head machine screw or stove bolt. The body part of the screw fits very loosely in the hole made for it, since the space between the screw and the edges of the hole is intended for the escape of steam. A leather washer should be placed under the head of the screw to serve as a gasket to make the joint steam tight. The entire

[1]Previous projects in this series were illustrated and described in the March, April and December, 1915 issues of this magazine.

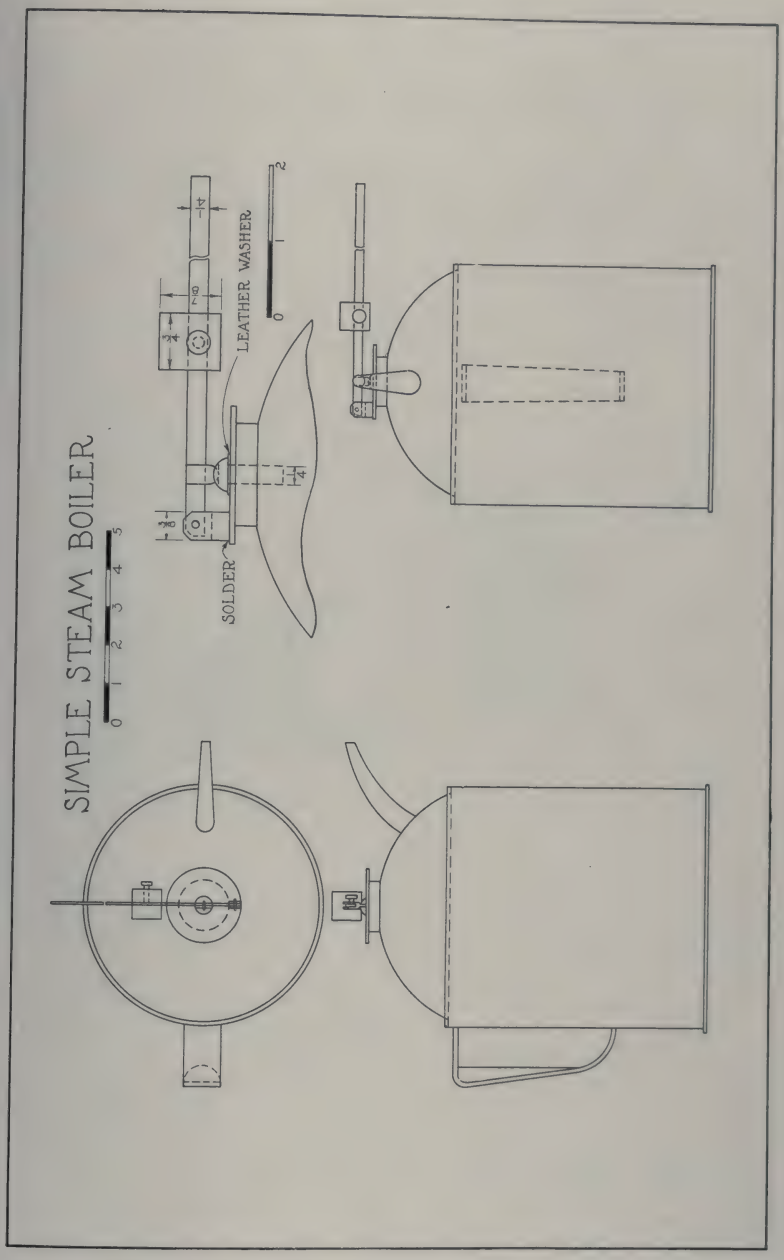


FIG. 7.

mechanism is fastened to the removable cap of the can or a disc of No. 18 gage copper soldered to it, the latter to allow more working space for the short arm of the lever.

In the position indicated in Fig. 7 the pressure figured theoretically is about six pounds per square inch. This calculation was verified by means of a test from the steam power plant of the school.

The steam is carried from the spout of the boiler to the engine or turbine by means of a rubber tube. Automobile supply houses carry a tubing for use in piping acetylene gas to lamps, which is rather inexpensive and serviceable for this purpose.

The boiler shown on the right of Fig. 6 is similar to the one described above except that it is made of a one quart olive oil can.

Fig. 8 shows a thirty cent power plant hooked up to the rocking beam engine described in the December, 1915, issue of this magazine. The materials required



FIG. 8.

are a two-quart kerosene can, a gas burner and four feet of gas hose, all of which may be secured at the 5 and 10 cent store at the price given. An alcohol burner may be used to supply the necessary heat, or the boiler itself may be placed on the kitchen stove.

The boiler shown in Figs. 9 and 10 is larger and more complex than those described above. It was devised to supply steam for the larger and more powerful engines which will be described in later contributions to this series. The boiler itself is made of a section of 6″ steam pipe, the ends of which are trued up in a lathe. The cast iron ends of the boiler are faced true, and the "seats" for the 6″ pipe cut while the job is in position in the lathe. Nine holes are drilled in these end castings to fit 1″ flues. After the ends are securely drawn into place by means of ½″ stay bolts, C in Fig. 9, these flues are "rolled" steam tight in the approved manner of performing this operation. The ends of the flues should be annealed before attempting this part of the work.

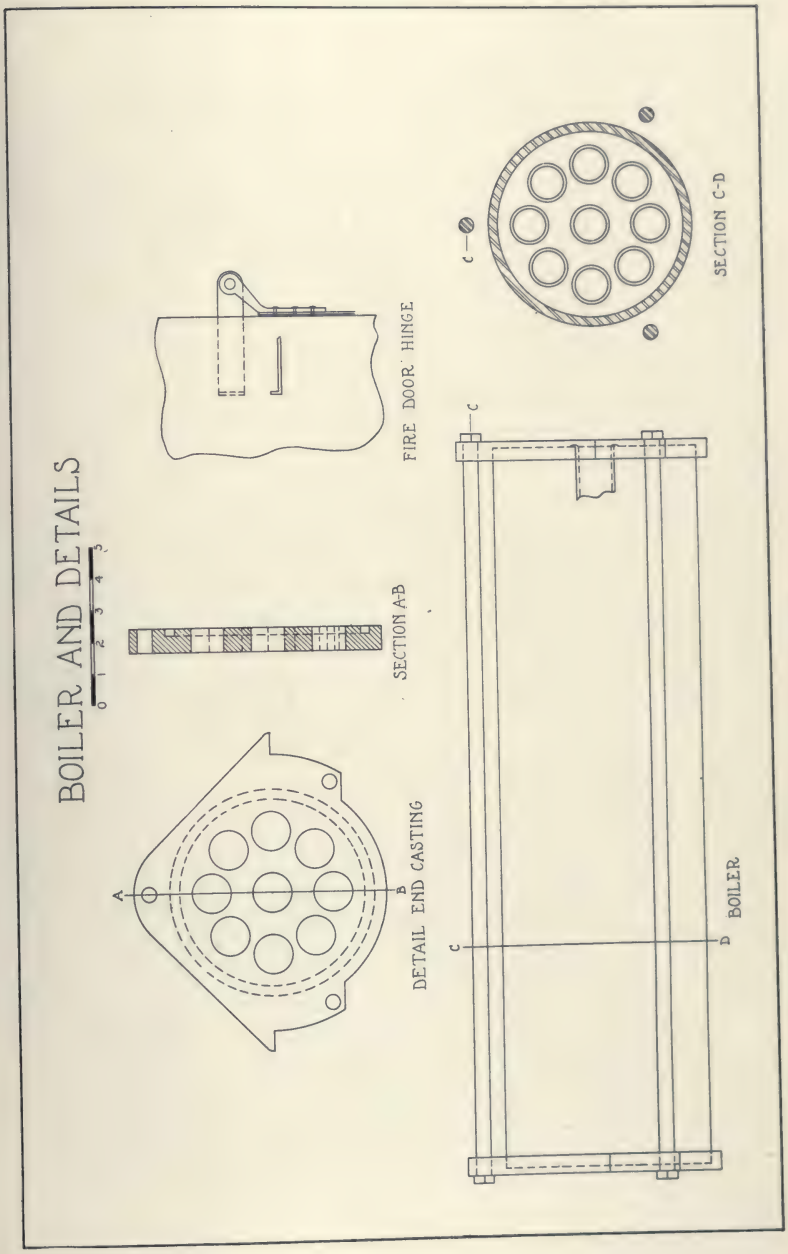

BOILER AND DETAILS
0 1 2 3 4 5
A
B
DETAIL END CASTING
SECTION A-B
FIRE DOOR HINGE
C
C
SECTION C-D
C
D
BOILER

FIG. 9.

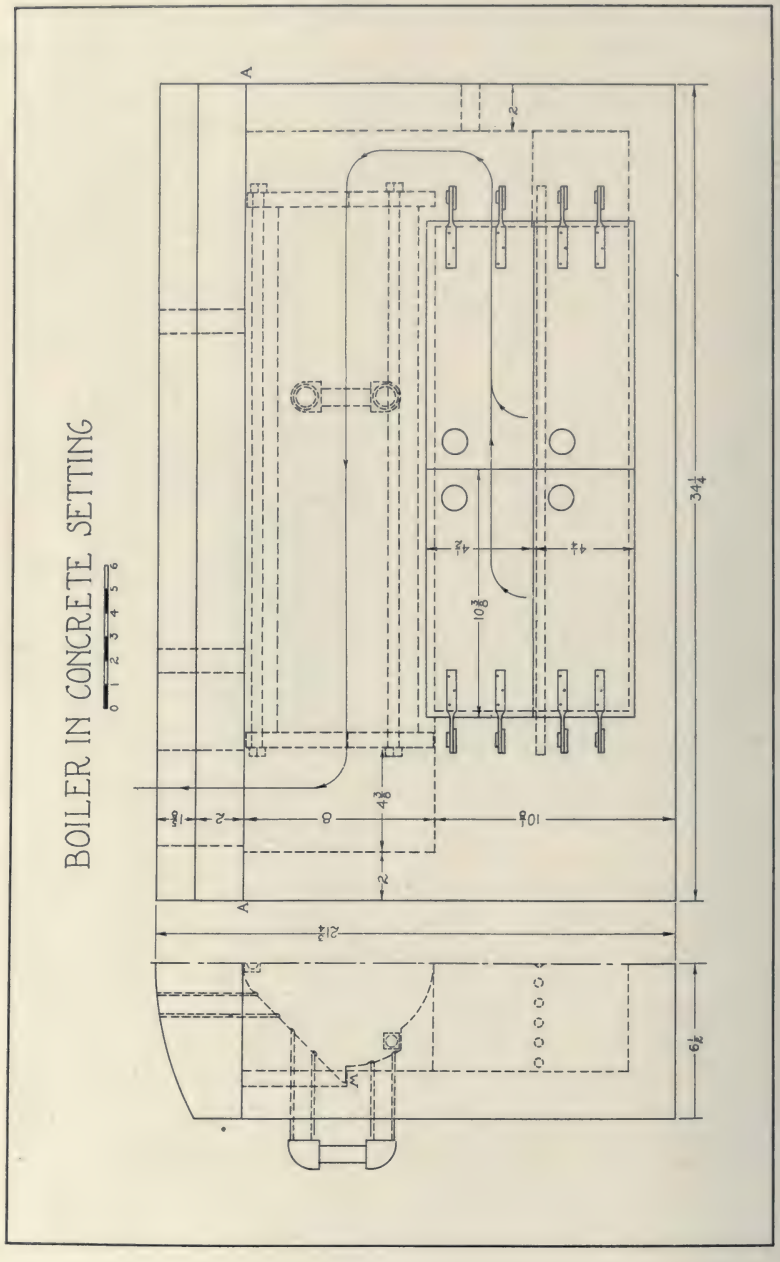

BOILER IN CONCRETE SETTING
0 1 2 3 4 5 6
A
A
2
34¼
4½
4½
10⅜
4⅜
2
8
101
2
21½
6½

FIG. 10.

A concrete boiler setting for the shell described above is shown in Fig. 10. It is made in two parts, the cap lifting off at AA. This construction makes it possible to cast the body part of the setting in one piece without the cumbersome task of assembling the boiler itself in the mold for the cement. After the body part is cast and cured, the boiler is put in place, the lugs of the boiler resting on a ledge of the concrete, as shown at M in Fig. 10. The cap is then placed in position and sealed, "neat" cement being used. In this type of boiler the heat circulates freely around the shell, but it must pass through the flues and up the stack in order to get out.

About one-fourth by volume of finely shredded asbestos should be mixed with the concrete when casting this boiler setting. A good mixture for the job will be as follows:

1 part cement.
3 parts sand.
¼ of entire volume, fine asbestos.

FRED P. REAGLE, Montclair, N. J.

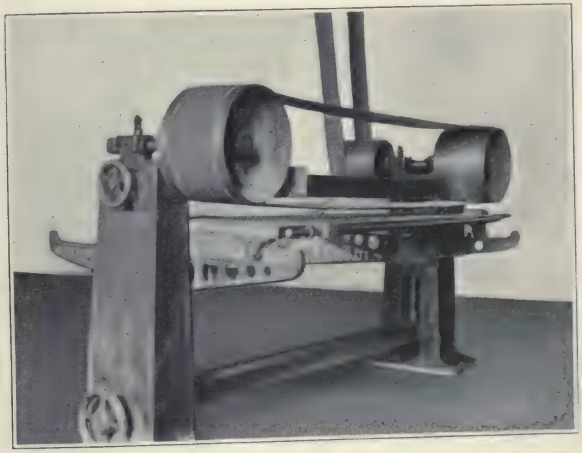
SHOP KINKS.

One of the easiest ways of cleaning grease out of files, is to use benzine or gasoline and a file brush.

When using liquid glue, do not clamp the material up too soon; give it time to enter the pores, as it does not penetrate as quickly as hot glue.

Rub the plane bottom with a piece of tallow, and the amount of force required to push the plane will be greatly reduced. If oil is used, it is likely to soil the wood.

—J. D. DE BRA, Columbus, O.



A BELT SANDER DESIGNED BY JOHN GRAFF, AND MADE IN THE MACHINE SHOP OF THE MANUAL TRAINING HIGH SCHOOL, PEORIA, ILL., UNDER THE DIRECTION OF B. F. HAZZARD, INSTRUCTOR. THE DRAWINGS WERE MADE IN THE MECHANICAL DRAWING DEPARTMENT UNDER THE SUPERVISION OF CHARLES W. CHANCE.

REVIEWS

The Industrial and Commercial Schools of the United States and Germany, by Frederick Wm. Roman. S. P. Putnam's Sons, New York, 1915. 5x7½ inches; 382 pages; price, $1.50.

This is a comparative study of the instruction given in the elementary schools of the United States and Germany, presented for the purpose of showing what foundations exist in the two countries upon which industrial and commercial training can be based. There is a comparison of the character, quantity and quality of literary education in the United States and in Germany, of the grades reached by the pupils before leaving the elementary school, and the general attitude of the pupils toward work, play, and life. There are historical sketches of the industrial education in both countries. The effects of commercial education combating poverty and crime are pointed out. The difference in the attitude of labor organizations toward such education is analyzed, and the industrial strength of the two nations is compared.

The Schools of Tomorrow, by John Dewey and Evelyn Dewey. Published by E. P. Dutton and Company, New York, 1915. 5⅛x7¾ inches; price, $1.50, net.

In this volume Professor Dewey presents a picture of the school of the future, based upon observations he and his daughter have made of various schools thruout America that are working out theories, and trying experiments designed to help the school and fit itself into the living conditions of the age. He shows what the results are when experimental schools start to put into actual practice what he considers the soundest fundamental principles of elementary education. These principles are already a part of our intellectual heritage, having been pointed out as best by philosophers and educators from Plato down; especially by Rousseau, Froebel and Pestalozzi. But they have not, up to this time, been thoroly tried out in practice. Now they are being so tried out in schools that are "experiment stations" "from Gary, Ind., to Fairhope, Alabama, and from Teachers College Kindergarten in New York to the Francis Parker School in Chicago." Every point Professor Dewey makes he illustrates by some successful experiment made in these schools; and he thinks that the lead they set will be followed thruout the country in "the schools of tomorrow." This book is "the most significant and informing study of educational conditions that has appeared in twenty years."

Industrial Education in the Elementary School, by Percival R. Cole. Houghton Mifflin Company, the Riverside Press, Cambridge, 1914. 4½x7 inches; 64 pages; price, 35 cents.

This is a volume of the Riverside educational monographs, the purpose of which is to prove that there should be introduced into the elementary school a subject called "Industry." It points out what will be the necessary reconstruction of school curriculum and school method when this is done.

This book is a practical text on the subject of wrought iron work, by a master tion, showing that the civilized world, even up to the present time, is dominated

by a false aristocratic view originated by the Greeks. This view is undemocratic and inadequate under modern conditions, since our life, culture and ideals are now of necessity, based on industry. The consequences of this obsolete conception of industry are antagonism of classes, ignorance of industrial operations, a pernicious separation of industrial from general education, and an unfortunate lack of industrial education in the elementary school. Division III presents a statement of the present problem, giving the distinction between industrial and vocational education, pointing out what the elementary school should do, and what are its existing resources, describing modern experiments in industrial education and showing our need to expand our appreciations of industry.

Industrial Art Textbooks. Parts One, Two, Three and Four, by Bonnie E. Snow and Hugo B. Froelich. The Prang Company, New York. 7½x10 inches; 72 pages; price, 25 cents each.

When completed this series of textbooks will consist of eight books, listed at a uniform price and having the same number of pages. Each book is divided into eight chapters, and a given chapter covers the same subject thruout the series. Thus a child completing the eighth grade will have covered graded courses in all of the eight subjects. The titles of the chapters are as follows Chapter I. Design and Color; Chapter II. Commercial Design; Chapter III. Costume Design; Chapter IV. Interior Decoration; Chapter V. Domestic Art; Chapter VI. Constructive Design; Chapter VII. Object Drawing; Chapter VIII. Nature Drawing.

It will be observed that the shifting of the emphasis from drawing to design is the marked characteristic of this new series of books. In this respect they certainly strike "A New Note." They are revolutionary in their point of view and general plan, and the orthodox teacher of drawing may be slow to adopt them. However, they have the approval of those who "believe that the teaching of art should be related to the actual life of the child and the great industrial movement, rather than to the studio of the painter." It may seem rather ambitious to talk about teaching a first-year child "design," but he can be taught some of the basic principles in the elementary way necessary to his age without the use of the term. The teacher will *think* in terms of design, but express herself in the language of the child.

Each part contains two pages of charming color plates, and the designs thruout are well drawn and simple. The arrangement of the material on each page also shows careful thought. Thus both publisher and authors have conspired to produce a series of art books that will indeed meet developing needs.

Elementary Geography, by Harmon B. Niver. Hinds, Noble and Eldridge, New York City. 7⅞x10¼ inches; 360 pages; price, 75 cents.

This is an elementary geography with many maps and illustrations. It seems better adapted than the average text for work in prevocational classes. The book is more extensive than the ordinary eighth grade geography. Some idea is given of the products and industries of different countries, and the author aims to teach the pupil to study geography thru the life around him.

Lessons in Art, Vols. I. and II., by W. H. Williams. Educational Publishing Company, Boston. 5½x8 inches; 444 pages; price $1.25 per volume.

This book aims to furnish pupils in the preparatory schools, general knowledge and technical information about art. It may be used as a guide, in art study clubs, and in home reading groups. There are 218 illustrations, and quotations from artists and poets.

Studies of Trees, by J. J. Levison. John Wiley and Sons, New York. 5x7¾ inches; 253 pages; 156 illustrations; price $1.60, net.

This book is a brief and not too technical treatment of tree study, and is intended as an all-round text for beginners. Only the more common trees of the United States, particularly the north-eastern section, and of Canada are presented. In the various chapters devoted to the identification of trees the following outline has been observed; distinguishing characteristics, leaf, form and size, range, soil and location, enemies, value for planting, commercial value, and in some cases, comparisons.

The chapters devoted to forestry, planting and care of ornamental trees, and to the properties and structure of commercial woods has been written with a simplicity which makes the text adaptable for younger students than those who ordinarily pursue courses in tree study.

Mechanical Drawing for Colleges and Universities, by James D. Phillips and Herbert D. Orth. Scott, Foresman and Company, Chicago and New York. 5½x8½ inches; 283 pages; price, $1.75.

This book is intended for use in college and university classes and is complete in itself. Previous experience in drawing is not anticipated as a necessary prerequsite for this course.

The divisions into which drawing naturally falls in drafting-room practice are followed in this book. Beginning with sketching and perspective the various steps, including tracing and blueprinting, are presented in their logical order. Recognition has been made of the fact that in drafting-room practice much emphasis is now being placed on perspective sketching as a means of interpreting orthographic drawings. Special attention has been directed toward this subject by the authors.

In general the aim has been to teach the principles of drawing thru a course in working drawings supplemented with lectures and recitations. The book has been worked out with great care for detail and with the best methods of teaching the subject constantly in mind.

Mathematical Tables, by Mansfield Merriman. John Wiley and Sons, New York. 5x7½ inches; 67 pages; price 50 cents, net.

The tables in this book were taken from The American Civil Engineer's Hand-Book. Included in the tables are the following: Computations of squares, square roots, reciprocals, areas of circles, weights, measures, logarithms and trigonometric functions. The brief explanations especially prepared for this volume will make the tables readily understood. These tables should prove to be time and labor saving to students in the class room, laboratory and field.

Practical Forging and Art Smithing, by Thomas F. Googerty. The Bruce Publishing Company, Milwaukee, Wisconsin. 5x7¾ inches; 144 pages; price, $1.00.

This book is a practical text on the subject of wrought iron work, by a master craftsman. The first part of the book is a practical treatment of the subject of forging. The various common practices now employed are presented to the student thru a series of exercises comprising tools and various appliances.

The distinctive feature of the book is the excellent treatment of the problems in art smithing. In this Mr. Googerty excells and his word is authority among teachers of metalwork. The book is well illustrated with photographs and line drawings.

Selection and Preparation of Food, by Isabel Bevier and Anna R. Van Meter. Whitcomb & Burrows, Boston. 5x7½ inches; 110 pages; price, 75 cents.

This is the revised edition of a manual originally prepared for the students of home economics in the University of Illinois. The revision embodies some of the suggestions gathered in the years of experience in using the book in the laboratory. The author's experience has demonstrated that "the principles of cooking may be taught by the same general methods as are used in teaching the principles of chemistry, i. e., by a study of typical compounds." The development of this idea has suggested a study of a given food until the student has acquired some familiarity with that type. In this, as in all educative processes, orderly development has been observed. The courses as given continue during two semesters, and include four hours of laboratory work per week, supplemented by one lecture and one recitation.

Food and Nuitrition, by Isabel Bevier. Whitcomb & Burrows, Boston. 5½x7½ inches; 80 pages; price, $1.00.

This book is distinctly a laboratory manual which has been revised several times in order to keep pace with the development of the sciences which furnish a basis for the study of food and nutrition. It was intended primarily for the use of students in the Department of Household Science at the University of Illinois, and the subject matter is, therefore, arranged with reference to correlation with the pure science work given in the University. In addition to many helpful references, the book also contains a comprehensive bibliography.

The Boot and Shoe Industry in Massachusetts as a Vocation for Women; "Studies in Economic Relations of Women," Volume VI. Published by United States Bureau of Labor Statistics, Washington, D. C. 5½x9 inches; 109 pages; price, 80 cents, postage extra.

This book presents the findings of an investigation of conditions as related to women, in the Massachusetts shoe industry. It gives the purpose and methods of the inquiry, the history of the industry in Massachusetts, its present extent, the distribution of the Massachusetts shoe towns, and the place of women in the industry. It describes the nature and conditions of women's work in the factories, the technical processes, methods of learning the trades, hours of labor, foctory conditions and sanitation. A chapter is devoted to the wages of women shoe

workers, which have generally been considered somewhat higher than those of other women factory workers. In this connection, the report shows that there are great variations in earnings, and an unfortunate seasonal fluctuation. The last chapter deals with such topics as the effect of sex upon earnings, the effect of nationality, the effect of employment of minors upon women's earnings and the relation of women to labor unions. It was found that while women are paid at the same rate as men, the average of their earnings is less because they do not accomplish so much work. The living conditions in factory and lodging house were found to range from very good to execrable, the worst being in Lynn.

First Aid in the Laboratory and Workshop, by Arthur A. Eldridge and H. Vincent A. Briscoe. Longmans, Green and Company, Fourth Avenue and 30th Street, New York. 4¾x7¼ inches; 32 pages; price 35 cents, net.

This is a condensed hand book suitable for factory and school shop. The common injuries which are likely to occur in places of that kind are briefly described and suitable "first aid" suggested. The book also contains a list of materials suitable for a "first aid" cabinet in a shop. Approved methods of treating electric shocks, suffocation and various kinds of poisoning and of performing artificial respiration are suggested.

Vocational Mathematics, by William H. Dooley. D. C. Heath and Company, Boston, New York and Chicago. 5x7¼ inches; 341 pages; price $1.00.

This presentation of the subject of vocational arithmetic is especially adapted for such high schools as offer a considerable variety of vocational subjects in the first two years of their curriculum. The arithmetical problems arising in a great variety of industries are presented in a practical manner. The treatment is thoro, and numerous illustrations add to its value.

In schools of a decidedly vocational nature, the text becomes a good substitute for the usual courses in algebra and geometry. The breadth of the field covered by this book makes it rather unusual. Seldom do books of this type relate to such a great variety of industries.

How to Study and What to Study, by Richard L. Sandwick. D. C. Heath and Company, Boston, New York, Chicago. 4½x6½ inches; 175 pages; price 60 cents.

The author has the following to say which explains well the purpose of this book:

"It is my belief that students have a right to as much and as expert coaching on how to study lessons from books as they receive on how to play football, how to dance, or how to do anything else."

It would be well for all high school students to read this book in their freshman year.

Practical Mechanics, by Joseph W. L. Hale. Published by the McGraw-Hill Book Company, Inc., 239 West 39th St., New York. 4½x7 inches; 228 pages; price, $1.00, net.

This book grew out of five years' experience in organizing and developing a system of railroad shop apprentice schools and in investigating the needs of other industrial schools. The many problems arising in machine shop experience and the mechanical trades, together with the principles underlying such physical laws as work, heat, power, etc., are fully discussed and explained. Several chapters are also devoted to geometry, logarithms, electricity and strength of materials.

This book is especially suited to the needs of railroad schools, but could also be used to advantage in many industrial schools.

Location of Carburetion System Troubles Made Easy, by Victor W. Page Published by the Norman W. Henley Publishing Company, 132 Nassau Street, New York. A large chart printed on heavy bond paper; price 25 cents.

This chart shows a typical automobile carburetion system full size. Sections are taken to fully illustrate the principal parts and their action. All parts are named, troubles analyzed, and their remedies given. This chart would be valuable to a teacher in explaining carburetor action to a class.

Alternating-Current Electricity and Its Application to Industry, by W. H. Timble and H. H. Higbie. John Wiley and Sons, New York. 5¼x7½ inches; 535 pages; 389 figures; price $2.00, net.

This book presupposes the student to have a slight knowledge of electricity such as might be obtained from a study of the first nine chapters of Timbie's *Elements of Electricity.* It is intended for high-school classes where a course in alternating-current electricity, complete enough to be a proper foundation for the more advanced work of technical schools and colleges is desired.

The field covered by the text is greatly simplified by the use of many illustrations, by practical application of principles and by shortening the steps by which new ideas are introduced.

Mathematics for Machinists, by R. W. Burnham. John Wiley and Sons, New York. 5 x 7 inches; 200 pages; 175 figures; price, $1.25 net.

This book is a small text covering the mathematical field of machine-shop practice. "Beginning with fractions, the book aims to give, in elementary form, explanations of the calculations most frequently occurring in the machine-shop." The problems presented are made very simple so that even a beginner may readily grasp them. In showing the application of general physical and geometric laws to mechanics, and in illustrating such specific machine-shop problems as thread-cutting, gearing, lathe and milling machine operation, and planer, shaper, and drill-press work, it will be found that the value of the text is greatly increased by the judicious use of many simple figures. The authors have attempted to make all of the explanations so simple that anyone who makes use of the book should find that there is no longer a need of the "rule of thumb."

The book is designed to meet the needs of trade, evening, and continuation schools. It is also well adapted for use by an apprentice, or a machinist who wishes to attain a broader knowledge of his work.

RECEIVED

English Grammar Simplified, by James C. Fernald. Funk and Wagnalls Co., New York. 4½x6½ inches; 270 pages; price 75 cents.

This is a brief but complete summary of English grammar, noteworthy for its simplicity of language and plain common sense. It is designed as a book for quick reference and authoritative decision, for school, office and home.

Free Hand Drawing—A Text for High and Normal Schools, by H. R. Augsburg. The Educational Publishing Company, Boston, 1915. 5½x7¾ inches; 248 pages; price, 75 cents.

The aim of this volume is to teach high-school and normal students the essentials of form, and the art of representing it on a flat surface.

Logarithms of Numbers, by Horace Wilmer Marsh. Interpolated six-place tables, and the natural and logarithmic trigonometric functions. John Wiley and Sons, New York. 6½x9½ inches; 155 pages; price $1.25, net.

Free Textbooks and State Uniformity, by A. C. Monahan. Bulletin No. 36, 1915, United States Bureau of Education, Washington, D. C.

Plane and Solid Geometry, by Webster Wells and Walter W. Hart. D. C. Heath and Company, New York and Chicago. 4½x7 inches; 467 pages; price $1.30.

Solid Geometry, by William Betz and Harrison E. Webb. Ginn and Company, Boston. 5x7 inches; 177 pages; price 75 cents.

The Edison Alkaline Storage Battery, by the technical staff of the Edison Storage Battery Company. National Education Association Joint Committee Series, Monograph III. Copies may be had upon application to J. A. Randall, Pratt Institute, Brooklyn, N. Y.

Home Projects in Secondary Courses in Agriculture, by H. P. Barrows. Bulletin No. 346, United States Department of Agriculture, Washington, D. C.

School and Community Survey and Community Welfare Week. A bulletin of announcement published by the University of Utah. This bulletin is Vol. 8, No. 3.

Report on Evening Schools, from the *Seventeenth Annual Report of the City Superintendent of Schools,* 1914-15, *New York City.*

The Saw in History, contains a comprehensive description of the development of the saw from the earliest times down to the present day. A pamphlet published by Henry Disston and Sons, Philadelphia, Pa.

MANUAL TRAINING AND VOCATIONAL EDUCATION

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FOREWORD

NOW that the traditional curriculum of the public schools is again under fire, and this time from men who cannot by any means be called extremists in industrial education, our initial article in this issue seems timely. It is written by *Leon W. Scott,* of the Southern High School, Philadelphia, Pa. The article points out that because of changed social ideals, and commercial and industrial development, the old type of curriculum is giving way to the imperative demands of practical education. Strong emphasis is placed on the principle that the needs of the masses of the people should receive first attention. The grammar school being truly for the masses should train for life itself and not merely for the high school. Upon it the strength of the nation rests.

In the second article *Richard Zeidler,* of Palo Alto, Calif., helps us to see "which way the wind is blowing" in the minds of boys on the Pacific Coast who have expressed their occupational preferences. An overwhelming number seem to prefer technical and mechanical pursuits.

A unique and seasonable article is the one on "The Child and His Garden Tools," by *Hugh Findlay,* assistant professor of horticulture, Syracuse University. The message is told by means of illustrations; it is a story without words. Of the other illustrated articles the one by *J. H. Tipton,* of the University of Utah, will be of interest to some of our readers in township and county high schools. The fourth and last in the very valuable series by *L. Day Perry,* of Joliet, Ill., appears in this issue. In a thoroly practical way it treats the subject of "Reed Weaving."

The term "prevocational" which has been under discussion in the past two issues is again treated—this time in a short article by *James McKinney,* of the Ethical Culture School, New York City. This article is followed by the fourth article on the Cleveland survey, by *William E. Roberts.* This one should be of special interest to our readers because it considers those parts of the survey which relate to the building trades, railroad and street transportation, and boys and girls in commercial work.

This Magazine is kept for sale at McClurg's in Chicago, and Brentano's in New York.

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FIELD NOTES

A very illuminating piece of educational literature is the report of the Division of Educational Research of the Public School System of New Orleans, prepared by Dr. David Spence Hill, director of the Division. The portion of the report covering "The Ideals of Children and the Occupational Preferences of Seven Thousand Pupils Thirteen Years of Age and Older in New Orleans and the Problem of Vocational Guidance" brings out much information that will be helpful to those guiding children in their choice of a vocation. Under the sub-head "Age and Ideals" Dr. Hill says:

"We have found in previous studies a uniform tendency in children passing from six years of age through the successive years to fourteen, to emulate the persons in immediate environment, as father, mother, other relative, teacher, playmate, or other familiarly seen character. As the boy or girl grows toward adolescence his or her social and mental life enlarges, and his or her ideal is influenced by characters in more remote environments, as persons in public life, or history, biography, etc."

A classification was made of the choice in vocation of 2244 white boys and 2821 white girls from the elementary school, and of 551 high school boys and 384 high school girls. An analysis of the 5065 returns from the elementary schools showed that 60 per cent of the parents of boys and 65 per cent of the parents of girls have no occupation in view for these children, while it was found possible to tabulate hundreds of cases in which parents and the son or daughter disagreed concerning the occupation for him or her. It was learned also from the parents that the vast majority of these thousands of school children thirteen years and older are without training for chosen occupation. This was regarded as the more significnt because 90 per cent of the children entering the elementary schools do not complete the high school course.

VOCATIONAL SCHOOLS A SUCCESS IN BUFFALO.

The success of the four vocational schools of Buffalo, New York, having a capacity for about 500 students, has been such that F. H. Wing, director of vocational work, believes that every section of the city should have a vocational school. Mr. Wing predicts that with greater facilities 1000 pupils would enroll for the next term, and within three years there would be 5000. "The schools in the last five years have proven beneficial," said Mr. Wing. "Boys have been enabled to start in the trades as advanced apprentices earning good wages. The stage has been reached where employers have applied to the schools for students to take work with them. We have had no difficulty in placing every boy who has been trained in the schools and who desires to get work. In my files today are copies of agreements with labor unions, among them the printers' union, whereby boys will be given credit for time in the schools toward completing their apprenticeship. The agreements mark a long step in direct co-operation of labor with educational systems."

COUNTY ORGANIZATIONS IN NEW JERSEY.

County organizations of teachers of the manual arts is a development that is rapidly taking place in the state of New Jersey. The Mercer County Association of Practical Arts Teachers is the latest to be added to the list. Each organization takes practically the same form; in addition to the regular officers there is a governing board consisting of two delegates from each group of teachers represented. The movement is being encouraged by L. H. Carris, assistant state commissioner of education, and E. A. Reuther, state supervisor of manual training.

The second meeting of the Industrial Teachers' Association of Hudson County, New Jersey, was held at the Industrial School in Hoboken. The early part of the day was given to viewing the exhibition of the work of the evening vocational school for girls, a department offering three-year courses in sewing, dressmaking and millinery, and graduating 45 girls this year. The exhibit was a large and varied one, containing some 2,500 pieces of work.

At 11 o'clock the following program of round

(*Continued on p. VI.*)

table sessions was held, representing the more serious work of this organization:

Machine Shop Section, J. F. Carr, Chairman—Importance of Machine Shop Organization in Teaching. Mr. Burghardt, Jersey City.

Woodworking Section, L. C. Wagoner, Chairman—Woodshop Notes, Mr. Davis, Hoboken. Organization of Elementary Shop Classes for Productive Work, Mr. Baumritter, Jersey City.

Domestic Science Section, Miss C. E. Alden, Chairman—Large Quantity Cookery, E. G. Traua. Importance of Kitchen Organization, Miss A. L. De Planter.

Sewing and Dressmaking Section, Miss Frances Cassidy, Chairman—Dress Patterns and How They are Made, Mr. Seegar, The Butterick Co. Drafting Patterns, Miss Capron, Jersey City.

Industrial-Academic Section, Mrs. C. K. Carswell, Chairman—Correlation of Machine Shop Problems with Arithmetic, M. W. Haynes, Bayonne, Mrs. M. L. Gannon, Bayonne, Miss M. C. Hamill, Jersey City.

Drawing, W. O. Hamblin, Chairman—Applied Design, Miss M. R. Sabourin, Jersey City.

At the close of the conferences the association reassembled for luncheon, good fellowship and addresses of a more general nature. The session closed with brief addresses on industrial education by W. L. E. Keuffel, president of Keuffel & Esser Co., and A. J. Demarset, superintendent of the Hoboken schools.

A NEW MANUAL TRAINING ASSOCIATION IN TEXAS.

In response to a call from O. A. Hanszen, of the department of school visitation of the University of Texas, the manual training teachers of North Texas met March 26 at the Dallas high school and organized the North Texas Manual Training Association. The officers elected were C. M. Haines, of Ft. Worth, president, and A. B. Sage, of Dallas, secretary-treasurer.

Sessions were held both morning and afternoon. The morning discussions were divided into two parts. At 9:30 o'clock A. B. Sage and A. A. Scott, of Waxahachie, made short talks on "To What Extent Should the Manual Training Departments Execute Useful Work for the School Systems?" At 11 o'clock Sidney Swaim, of Dallas, and F. L. Scott, of Forth Worth, opened the discussion of "Uniform Standards and Methods of Grading Students' Work." Mr. Hanszen made some suggestions regarding the standardization of the work in all the schools of the state, and told what the University of Texas is doing for manual training.

At the afternoon session P. E. Harris, of Belton, and C. M. Haines, of Fort Worth, discussed the problems of adapting manual training to the needs of vocational education for the industries. S. A. Blackburn, of Dallas, and O. A. Hanszen emphasized the value of a laboratory manual in teaching manual training. The meeting next year will be held at Forth Worth.

PROGRESS OF VOCATIONAL EDUCATION IN WESTERN TENNESSEE.

For some months past events that have taken place in and about Memphis, Tenn., have been pointing toward a very sane and satisfactory development of vocational education for the near future. Especially significant in this connection may be mentioned the work of the Farm Development Bureau organized by the Memphis Business Men's Club, described in the March issue of this magazine. Another factor in this development is the coming of Dr. A. A. Kincannon from the presidency of the University of Mississippi to become the superintendent of public schools in Memphis. And the most important factor of all is the work being accomplished by the Vocational Grammar and High School of Memphis under the direction of John W. Curtis. In overcoming prejudices, in winning public favor, in ministering to the individual needs, tastes and capacities of students, this school has laid foundations which ought to insure strong development in the near future. This school ought to become a great technical school for the boys and girls of West Tennessee.

THE KANSAS MANUAL ARTS ASSOCIATION.

The annual meeting of the Kansas Manual Arts Association was held in Hays, Kansas, on

(*Continued on p. VIII.*)

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1916

March 10th and 11th. The program, which was characterized by discussions of practical subjects, was as follows: "Finishes," by J. G. Wilkins, State Manual Training Normal School, Pittsburg; "The Upkeep of the Shop," by J. E. Geyer, Hutchinson; "Rush Seating," by George K. Wells, Kansas State Normal School, Emporia; "Chair Caning," by V. M. Reppert, Russell; "Fine Inlays," by J. F. Parks, Witchita. A demonstration of upholstering by S. M. Enfield, of Hays, Kansas, and a general discussion of the materials necessary for a shop course, led by George K. Wells, occupied a goodly part of the second day's session. The following officers were elected for the ensuing year: President, George K. Wells, Emporia; vice-president, J. G. Wilkins, Pittsburg; secretary-treasurer, V. M. Reppert, Russell. The Association has planned to publish a bulletin, the make-up of which will be the work of the students in journalism at the Emporia Normal.

FARM WORK TAKES THE PLACE OF EXAMINATIONS.

A pamphlet sent out by the Ontario Department of Education contains special regulations exempting from attendance, for part time, and from examination, pupils of the public and separate schools, of the high and continuation schools and of the collegiate institutes who will do work on the farm during the spring and summer of 1916. This step is deemed necessary because of the scarcity of farm workers, which has resulted from enlistment. Timely and adequate provision must be made for planting and harvesting the crops of Canada, and inspectors and teachers are, therefore, asked to deal as liberally as possible with the situation thus created.

Under the direction of Professor B. W. Scheib, who is in charge of the community work for the State Manual Training Normal School, Pittsburg, Kansas, a community Sunday was recently observed in Monmouth, Kansas, at which time about 200 residents of the town and surrounding country gathered together to discuss questions of welfare. The three churches in Monmouth joined in the program of the day. Among the speakers were Rev. Walter Burr, of the Kansas State Agricultural College, Professor B. W. Scheib and Dean Hattie Moore Mitchell of the State Manual Training Normal School. The future of the rural school was the principal subject of discussion, though good roads, preparedness and state and county politics received due attention.

The earnestness with which some of our American youths pursue work in evening trade schools proves the need of such opportunities. At the closing exercises of the night school at the Worcester Trade School for Boys, 271 pupils were presented with certificates. The gasoline engine course had the largest class, 88 receiving certificates; the machinist class ranked second, with 65, while the electrical class numbered 20. The other nine courses had less than 20 each, as follows: mechanical drawing, 19; power plant operation, 17; architectural drawing, 14; carpentry, 12; cabinet making, 12; pattern-making, 8; printing, 8; estimating, 5; shop mathematics, 3.

In an address before the Boy Committee of the Central Council of Social Agencies, Milwaukee, J. Adams Puffer, director of the Boston Vocation Bureau, while urging the value of vocational counsellors suggested that their work should be rather to help the pupil discover himself and become acquainted with his own ability, than to be told what profession or vocation he should follow. He also pointed out that if the vocational adviser can enlist the aid of successful men and women who will take the time to talk with young people who are trying to choose their vocations he will be doing a big thing. He said, "Nothing inspires or encourages a boy more than a talk with a man who has gone thru difficult experiences and has done things worth while."

In an address at the University of Kansas sometime ago Jesse B. Davis, president of the National Vocational Guidance Association, urged that the stimulation of a definite aim in life for each pupil and the nursing and developing of that aim thru proper study and environment, constituted the proper work of the public schools. "For instance," said Mr. Davis, "in a class in European history, the boy who is planning to

(*Continued on p. X.*)

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become an architect may prepare for his research work, by use of the library and notebook, a history of architecture during the period covered. In like manner, the girl who hopes to become a musician can prepare a history of music. The ambitious designer may study the history of furniture design or mural decoration or some other application of his art. The would-be business man may be interested in preparing a history of transportation, or possibly the history of trade and barter with the use of money as a means of exchange."

In the *Teachers' Exchange* of the Oregon Agricultural College is a letter from George Calhoun, who teaches in a two-room school, near Walla Walla, Washington. This school is in a fruit section, consisting of small farms. The parents were called together to say what they wanted their boys to do. In every case, the answer was "Something useful." The work, therefore, was planned to meet the needs of the farm. First, the boys made their own work benches, then their play ground equipment—teeter boards, swings and a shoot-the-chutes. They next repaired their chairs and an organ, replaced broken glass, made their cook room furniture, repaired their out houses, and were ready for business. Their first order was for a hay rack. They have now a contract to make a wheat rack, and a feed rack for cows. For the rest of the year they plan to work on projects ordered by patrons—or orders failing, to make rat-tight chicken coops, gates, hog troughs and things the boys know can be used on the farms.

Large sums of money are held in trust for educational purposes in this country and one is often led to wonder how it is appropriated. In view of the general lack of information on this subject, the annual report of the General Education Board, founded by John D. Rockefeller, is of more than passing interest. The first installment of the report for the fiscal year 1914-1915 shows that since its organization and up to June 30, 1915, the Board had appropriated directly $16,862,147.71. Among the appropriations made, the following are of special interest to our readers: Salaries and expenses of supervisors of negro rural schools, $84,320.57; Salaries and expenses of rural school agents, $70,645.77; Farmers co-operative demonstration work in the South, $716,077.80; Farmers' co-operative demonstration work in Maine, $45,173.67; Farmers' co-operative demonstration work in New Hampshire, $24,593.49; Girls' canning and poultry clubs in the South, $113,751.52; Girls' and Boys' clubs in Maine, $11,205.12.

Barley, wheat, oats and many of the grasses are growing in rich sandy loam, beneath the tables in the greenhouse at the Central High school in Minneapolis. Within a short time an acre of ground close to the school will feel the plow and the teeth of the harrow. This class in agriculture for city boys is so intimately related to a real demand that of the 17 who began last September, two boys are now in the school of agriculture, one is taking agriculture at Duluth and a fourth is in the grain business; and of the 17 who began in February, two have already gone on farms. In other words, these boys were just ready to desert a school system which had nothing to offer them in the line in which they were most interested.

The course includes four years. Animal husbandry is the work of the second year, including types and breeds, animal judging, some veterinary work and dairying. Manual training and forge work in making farm implements, chicken houses, etc., is correlated with the work. The third year is devoted to farm mechanics, horticulture and soils, with a side course in chemistry, while the fourth year takes up farm management with physics as a side course.

The city of Racine, Wis., which is one of the biggest little manufacturing cities in the world, is confronted with the problem of crowded school conditions. There are 250 pupils in the high school taking the commercial course, and 200 taking the manual training and domestic science courses. Instead of building a new high school, Frank L. Glynn, who is directing the industrial school work for the state, has urged that an industrial school, built to take care of all of these special classes of students would re-

(*Continued on p. XII.*)

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(Two Courses)
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FIELD NOTES.

(*Continued from p. X.*)

lieve the crowded conditions in school buildings for years to come. In Mr. Glynn's outline of a plan under which the industrial school should be run, provision was made for an advisory board consisting of one employer and one worker in every branch taught in the school, thus affording school heads the benefit of practical advice when needed.

Two valuable lectures on woodworking tools were recently given at Bradley Institute by E. A. Cherry of the Stanley Rule & Level Co. One of these was before the members of the class of 1916 who are preparing to become teachers, and the other before the class of 1917 and such other students as were available at that hour. While the lectures were illustrated with Stanley tools, and were therefore to that extent an advertisement for these tools, the lecture itself was not confined to the particular tools shown, but was full of practical hints of real value to tool users. In giving such lectures Mr. Cherry is performing a real service. We understand that he is going to be available for a limited number of normal school engagements during the coming summer. Teachers who want his help should write early before he has made up his summer itinerary.

The construction of the new manual training building at the Western State Normal School, Kalamazoo, Mich., is being looked forward to with much anticipation. An appropriation of $75,000 has been made for the building, with an extra appropriation of $15,000 for equipment. Two-thirds of the entire structure will be composed of the following eight one-story shops: machine shop, forge shop, foundry, wood-turning shop, machine room, bench shop, mill room and tool room. When completed the facilities for high grade manual training work will be among the best.

In order to assist schools and colleges in planning celebrations commemorating Shakespeare's death, the Bureau of Education, in cooperation with the Drama League of America, has issued a bulletin giving practical suggestions as to kinds of celebrations, type performances, lists of dances, and designs for simple costuming for Shakesperian plays. The Bureau emphasizes the spec-

(*Continued on p. XIV.*)



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No. 152

STANLEY ADJUSTABLE SPOKE SHAVES

These new and improved Spoke Shaves have a Lever Cap fastening the cutter in such a manner as to bring an even pressure on the cutting edge.

The important feature is that the cutter can be quickly adjusted both endwise and sidewise by means of the adjusting screws which engage the slots near the end.

The Cutters are made from a high grade of steel, well tempered and sharpened ready for use.

The handles are japanned and through each a hole is made to enable the owner to hang the tool up out of the way.

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ESPECIALLY ADAPTED FOR MANUAL TRAINING USE

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FIELD NOTES.

(*Continued from p. XIV.*)

ial opportunity afforded by the Shakespeare Tercentenary to coordinate the school work in literature, music, and art with such practical subjects as shopwork and physical education.

A vocational conference under the auspices of the girls' clubs of the Nebraska State University was held on March 21 and 22. The chief speaker was Miss Helen Bennett, director of the Intercollegiate Bureau of Occupations, Chicago. The conference was held especially in the interests of girls who do not care to become teachers. The educational requisites and the training which are necessary to enter various vocations, the things which a girl or woman may meet in these vocations, and the financial returns she may expect, were discussed.

The University of North Carolina has modified entrance conditions for next year to the extent of accepting certain vocational subjects. However, for admission to the College of Liberal Arts a candidate may offer only two units in vocational subjects. These vocational subjects include: Commercial geography, a half unit; general agriculture, one unit; bookkeeping, commercial arithmetic and shorthand and typewriting, one unit each; manual training, two units.

In addressing the annual meeting of the Association of Secondary Schools of the Upper Ohio Valley, Dr. Cheesman A. Herrick, president of Girard College, Philadelphia, strongly urged making education practical to fit the youth of the country for business and industrial pursuits. He said "Train the youth in the subjects in which he is to be tested in life. Academic training is given in the belief that the mental training acquired thru it can be transferred to other lines. We have no guarantee, however, that the power acquired in one set of relations can be transferred to another set of relations."

More and more are the services of experts being sought by boards of education in planning the future of their schools. The school authorities of Manchester, N. H., have recently called into conference Alvin E. Dodd, secretary of the National Society for the Promotion of Industrial Education. The purposes of an educational sur-

(*Continued on p. XVIII.*)

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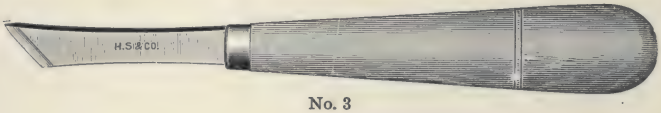
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FIELD NOTES.

(*Continued from p. XIV.*)

vey, its probable cost, and the possible results were fully discussed, the surveys made in other cities serving as a basis for judgment.

An announcement recently made by Robert O. Beebe, director of the Boardman Trade School, New Haven, Conn., will prove suggestive to other similar institutions. In planning for a broader training of the students in the boys' department, Alfred A. Berkwitz has been appointed instructor in general academic subjects which coordinate with the requirements of each particular trade. He will divide his time among several departments.

A social worker in the city of Chicago has recently called the attention of the board of education to the fact that no provision beyond the elementary education is made for the pupils in the Spalding School for Crippled Children. The need for vocational education that will enable them to become at least partly self-supporting was urged, with the result that steps have already been taken toward this end.

The plans of the Eastwood school in Houston, Texas, suggest the form of school building construction that is quite common in California. Instead of a one-building school in which all classes are taught in various rooms, the new type follows the cottage plan, wherein a central campus is partially surrounded by a group of buildings, each complete in itself. The plans for the Eastwood school provide for seven buildings, consisting of the administration building and six others, to which a gymnasium will be added later. Two class rooms and the domestic science and manual training departments will be housed in the administration building, along with the library, principal's office, teachers' rest room, and cloak room.

The April Round Table of the School Crafts Club, New York, was held on April 8, at the Broadway Central Hotel. There were six tables and the following departments were represented by the discussion of special topics assigned to the leaders mentioned:

Arts and Crafts—"Wood Carving in the Grades," by Lawrence J. Young; *Elementary*

(*Continued on p. XX.*)

Third Simonds Saw Prize Contest

PRIZE WINNERS

as awarded by

S. J. VAUGHN

Head Dept. Manual Arts, DeKalb, Ill., Normal School, and
Editor Industrial Arts Magazine.

CLASS 1. BOYS IN HIGH AND TRADE SCHOOLS.

First Prize—Marshall H. Enson, Olathe, Kansas.

Second Prizes—Raymond Murphy, Rochester, N. Y.; Ambrose Caliver, Tuskegee, Ala.; Russell A. Myers, Oklahoma City, Okla.

Third Prizes—H. C. Reese, Willmette, Ill.; J. Merritt Tippey, Earlham, Ind.; Thos. W. Jeffords, St. Louis, Mo.; Geo. H. Pfefferle, Appleton, Wis.; Raymond Steffens, Spring Valley, Minn.

Fourth Prizes—J. Hilgerman, Rochester, N. Y.; Edward Henry, Spring City, Pa.; Sim Phillips, Jr., Salem, Ore.; Donald Strudley, Stratford, Ont.; Fred E. Frankson, Spring Valley, Minn.; James Marchand, Tuskegee, Ala.; Earl Griffith, Elwyn, Pa.; Will Grudem, Brookings, S. Dakota; McKinley Paramore, Tallahassee, Fla.; Earl Mansbach, Campello, Mass.

CLASS 2. BOYS IN ELEMENTARY SCHOOLS.

First Prize—J. Gordon King, Boston, Mass.

Second Prizes—Wm. Muncey, Parkersburg, W. Va.; Vincent Schnurr, Stapleton, S. I., New York, N. Y.; Edward Essayean, Saratoga Springs, N. Y.

Third Prizes—Theodore Treat, Springfield, S. Dakota; Henry Condon, Aikin, Md.; John Slack & Smith Bolton, Saginaw, Mich.; Paul Sherry, St. Johnsbury, Vt.; Geo. W. Gustafson, Idaho Springs, Colo.

Fourth Prizes—Wm. Provenzane, Fitchburg, Mass.; George Niles, Buffalo, N. Y.; Ernest L. Shepard, Bath, Maine; Geo. Wilkins, St. Johnsbury, Vt.; Edgar Schaefer, Pittsburgh, Pa.; John Charles, Charlestown, Mass.; Andrew Walker, Fitchburg, Mass.; Theodore H. Robbins, Hartford, Conn.; Starling Yinger, Rosewood, Ohio; Frank W. McAfee, Colorado Springs, Colo.

CLASS 3. BOYS NOT IN SCHOOL.

First Prize—Henry S. Ritter, Germantown, Pa.

Second Prizes—Albert Keast, Grass Valley, Calif.; Paul Junghans, Fort Atkinson, Wis.; Arthur Westerhelweg, Cincinnati, Ohio.

Third Prizes—Rudolph Rulseh, Clintonville, Wis.; Geo. E. Seiler, Forestville, Wis.; Herman Slobin, Worcester, Mass.; Calvin Jimmerson, Alta, Iowa; Virgil Barbee, Grove City, Ohio.

Fourth Prizes—Roy Morton, Hazelhurst, Wis.; Erland Lundberg, E. Greenwich, R. I.; Frank Carella, So. Boston, Mass.; Vernor Nordberg, Duluth, Minn.; Clement E. Carroll, Galveston, Texas; J. Stewart Purdy, Imperial, Pa.; Angelo Serratoni, Detroit, Michigan.

The above names we are pleased to announce as winners of prizes in the third Simonds Saw Contest which closed February 29th. Prizes were forwarded to the winners April 1st. The large number of applicants for labels and the many photographs and drawings submitted made this one of the most interesting of all our contests. It is especially interesting to see that prize winners came from all parts of the United States. If you want information about Simonds Saws of any kind write for Booklet No. 3.

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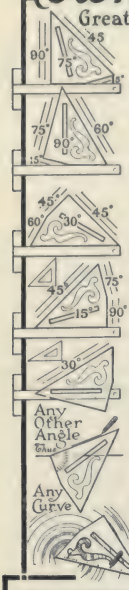
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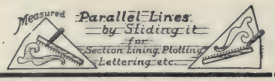


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FIELD NOTES.

(*Continued from p. XVIII.*)

School—"Elementary Mechanical Drawing as Applied to Shopwork," by Hilding Froling; *High School*—"The Value of Shop Tests," by R. F. Davis; *Mechanical Projects*—"Motors and Transformers," by Joseph H. Constantine and L. E. Hainert; *Vocational*—"School Printing," by Ralph A. Loomis; *Supervision*—"Methods of Discipline in Shop," by M. J. Corcoran.

In furthering plans already made for aiding the pupils of the city schools in studying the various vocations and professions, the National Union Bank of Rock Hill, S. C., last month sent out to the local high school and to the high school department of the Winthrop Normal Training School, pamphlets giving considerable information of value relative to the study of medicine. Each month literature on a different subject will be sent out, the work of the pupils to be devoted during the month to that particular subject. The following month pamphlets on agriculture were sent out. A circular letter accompanies each pamphlet which gives considerable information, some of which is of historic value.

The United States Department of Commerce has called the attention of the public generally to the serious shortage of raw materials for the manufacture of paper, including rags and old papers. About 15,000 tons of different kinds of paper and paper board are manufactured every day in the United States, and a large proportion of this, after it has served its purpose, could be used over again in some class of paper. A little attention to the saving of rags and old papers will mean genuine relief to our paper industry and a diminishing drain upon our sources of supply for new materials.

A conference of women farmers, florists and gardners, composing the Middle West members of the Women's National Agricultural and Horticultural Association, was held at the Chicago Art Institute on April 12 to 14. The headquarters of this organization are located at 600 Lexington Avenue, New York City. With a history of only two years, it has a membership of over 1,000, representing 38 states. It aims to

(*Continued on p. XXII.*)

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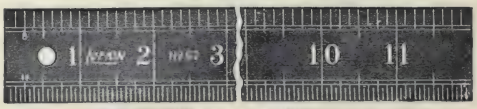
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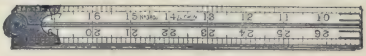
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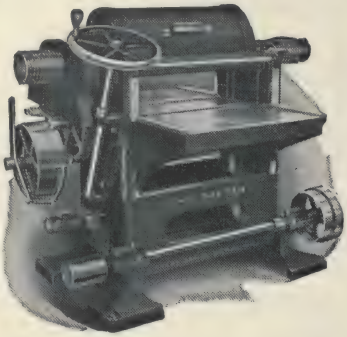
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FIELD NOTES.

(*Continued from p. XX.*)

serve the needs of all women engaged in these pursuits whether for pleasure or profit.

In addressing an open meeting of the Central Labor Union, Boston, G. Stanwood Field, director of the vocational and evening high schools of that city, emphasized the point that true democracy in education is obtained only when opportunity is provided for each pupil to satisfy his individual needs as an industrial unit and as a citizen. Judged from this standpoint the trade schools become an important factor in furthering democracy.

This year, for the first time, the West Tennessee Teachers' Association added a commercial and industrial section to its program. The meeting was held at the West Tennessee Normal School, Memphis, on the 14th of April. The speaker at this sectional meeting representing the industrial end of the program was Prof. Charles A. Bennett, of Peoria, Ill., who spoke on "The Present Outlook for the Manual Arts in Education."

Edward A. Krueger, formerly in charge of industrial education in the public schools of Gary, Indiana, has joined the staff of Popular Mechanics Magazine, Chicago, as technical editor in charge of the "Shop Notes" and "Amateur Mechanics" departments. In addition to a wide practical mechanical training, Mr. Krueger brings to his new position newspaper experience. He is a graduate of the Crane Technical School and the University of Wisconsin.

Valparaiso University, Valparaiso, Ind., has just received its first gift, consisting of 400 acres of land, located nearby, valued at $50,000. It is the gift of William E. Pinney and his daughter, and will be the means of enlarging the work of the department of agriculture.

A new high school building has just been completed in Miami, Arizona. The site was donated by the Miami Copper Co. and the cost of the building was $100,000. Although the student body numbers only 100 at the present time, ample provision has been made for growth, as their additorium has facilities for seating 350. In its

(*Continued on p. XXIV.*)

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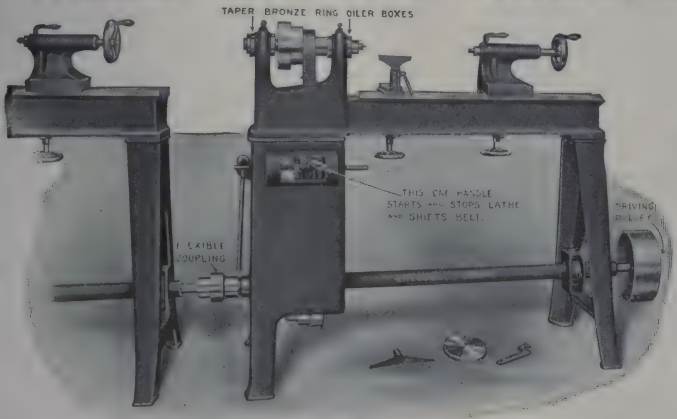
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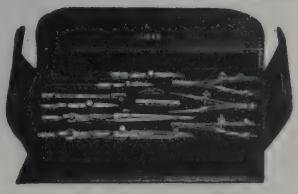
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FIELD NOTES.

(*Continued from p. XXII.*)

appointments it is one of the finest schools in the state.

The students in the manual training department of the new high school at Sandusky, Ohio, are making collection plates to be used in several of the local churches. Several students in the high school at Memphis, Tenn., are at work on the same problem.

W. F. Newell of LeGrand, California, has a regular class, in connection with shopwork, the object of which is to study every article found in the shops, including the lumber, from growth to finished product. This class has proven most interesting.

A demonstration exhibition of the manual training work of the public schools at Fort Worth, Texas, was recently held in the Coliseum under the direction of C. M. Haines, supervisor of the work. A forge and lathe were installed and relays of students were busily engaged showing what they could do along practical lines as a result of their training.

The first manual training shop in the city of Philadelphia to be utilized for continuation classes was opened a little over a month ago, with 444 boys enrolled. At the present time there are 30 continuation schools thruout the city with a total enrollment of 7,500 pupils requiring 57 teachers.





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TRADE NOTES.

At the recent meeting of the Vocational Education Association of the Middle West, held at the LaSalle Hotel in Chicago, several lines of goods were displayed which are not usually seen at meetings of this kind. Among them were the exhibits of the Singer Sewing Machine Co., showing many different styles of machines, and examples of innumerable kinds of work done on these various machines; Edison-Dick Mimeographs and Mimeoscopes of A. B. Dick Co.; Balopticons of the Bausch & Lomb Optical Co.; Sciopticons of the McIntosh Stereopticon Co.; Machinists Tools manufactured by Brown & Sharpe Co.; Shortwriter of the Shortwriter Co. of America; Burroughs Adding machines. Among those always represented at these meetings were E. C. Atkins Company, Indianapolis, and Thomas Charles Company, Chicago.

Barnhart Brothers & Spindler represented by W. H. French, the president of the Company, displayed a model school printing shop fully equipped, which offered many suggestions and practical hints to schools planning this department. Their display included a new space-saving steel cabinet for holding cuts, typematter, etc. The exhibit was the subject of much favorable comment.

E. C. Schiele, director of the educational department of Henry Disston & Sons, and W. A. Chenoweth, manager of the sales department, were both in attendance with an exhibit covering their full line. The latest booklet distributed by Henry Disston & Sons entitled "Why A Saw Cuts," is a beautiful piece of printing and contains much helpful information for saw users. Illustrations of the action of a saw on wood show why different kinds of saws are needed for varying kinds of work. To learn that eighty-two operations enter into the making of a Disston saw, from the making of the steel to the finished product, suggests something of the extent of this great industry. The booklet was written by F. M. Bassler.

The display of the Stanley Rule & Level Co., with E. A. Cherry in charge, included various tools, many made especially for school use. To those visiting the exhibit detail illustrations of the "Bailey" adjustable iron planes and the "Bed Rock" planes were distributed. These illustra-

(*Continued on p. XXVIII.*)



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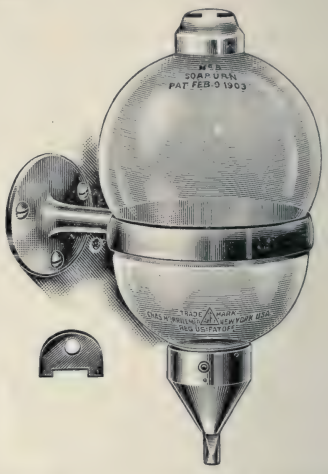
TRADE NOTES.

(*Continued from p. XXVI.*)

tions are prepared for the use of the student and can be inserted in the ordinary loose leaf notebook, size 9x11 inches.

The American Woodworking Machinery Co. were represented by F. J. Oberlander. The special features of their exhibit were a No. 902 Hollow Chisel Mortiser, No. 20 Universal Saw Table, No. 1, 6 in. Bench Jointer with improved safety cylinder, a special feature for school use.

R. D. Baldwin, representing the Simonds Mfg. Company, displayed a full line of saws made by this well known firm, and C. M. Larson, representing the Bridgeport Wood Finishing Co., had quite a complete exhibit of wood finishing materials.



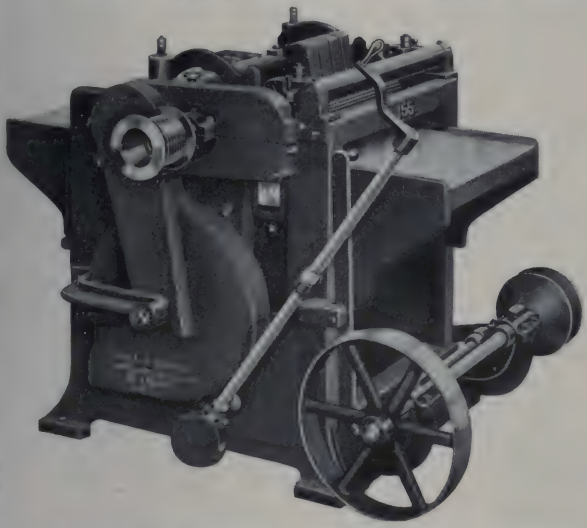
To those who are equipping a new building, or adding to their present equipment, the liquid soap dispenser which Chas. Morrill, 98 Lafayette St., New York, has recently put on the market will be of interest. The above is an illustration of their No. 5 Dispenser.

The Clark Teachers' Agency are utilizing a form of graf to indicate the efficiency of teachers along the following lines: character, knowledge of subject-matter, technic of teaching, governing skill, how teacher works under supervision, interest in student activities, personal appearance, social qualities, and disposition. It is thought that this method will simplify the rating of teachers. This agency has recently taken over the American Teachers' Agency in Knoxville, Tenn.

(*Continued on p. XXX.*)

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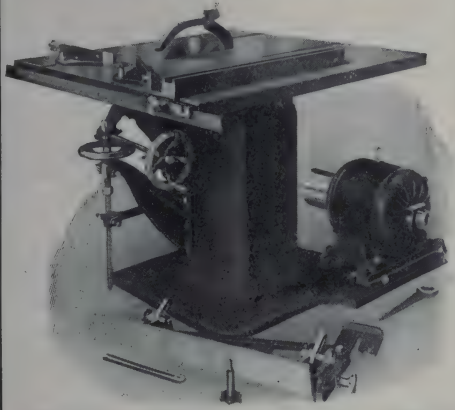
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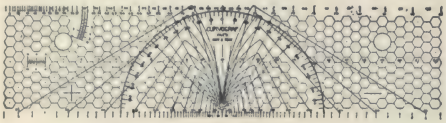
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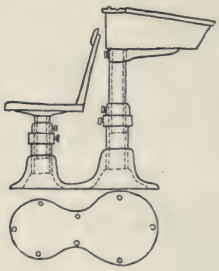
TRADE NOTES.

(*Continued from p. XXVIII.*)

The prize winners in the third Simonds' Saw Prize Contest have been announced and the prizes awarded. This contest closed March 1st and the awards were made by S. J. Vaughn, Head of the Department of Manual Arts of the Northern Illinois State Normal School. Their advertisement in this issue gives the names of the winners.

South Bend Lathe Works, South Bend, Ind., are distributing a circular illustrating and describing the milling and key-way cutting attachment for their lathes. They will be glad to send it to those interested.

The accompanying illustration indicates a new type of combination desk and chair for school use. It was designed and patented by Francis L. Bain, of the Dorchester, Mass., high school. Mr. Bain is a member of the Boston Manual Training Club.



The distinguishing features of this new school unit are its simplicity, wide range of adjustability, and its base which allows for sanitary sweeping or cleaning of the floor. The base is made of cast iron or pressed steel. The pipe standards are either threaded, shrink fitted or electrically welded into the base, according to the material used. The upper section telescopes thru the lower, and can be tightly locked at any desired height by means of the adjusting collar and set screws. This applies alike to both desk and chair.

In addition to the wide range of adjustability in height, the chair is free to revolve to the right or left. There is freedom from desk vibration so often experienced in a combination desk and chair. But a short time is required to screw this piece of furniture to the floor, and considerable less space is required than for the old style desk.



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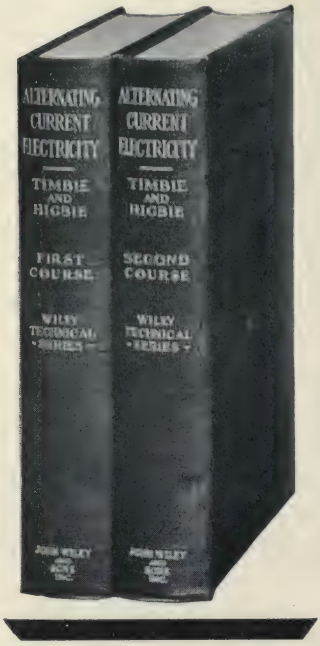
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BOOK NOTES

A third book has appeared in the series of textbooks on drawing in which Charles B. Howe of the Bushwick High School, Brooklyn, N. Y., is taking a leading part. This one is on *Mechanical Drafting,* and is in the same general style as *Agricultural Drafting* and *Architectural Drafting.* Like the other books mentioned it does not contain the course of study, this being furnished on supplementary loose-leaf sheets. The idea behind this plan is that the text is something which remains practically constant from year to year while the course of study is a changing thing. For this reason the two forms in presenting material to students are employed —the textbook and the problem sheets. Besides what is usually included under "mechanical drawing" the book treats of the drawing of plans and interior details of houses, plot and map drawing and pictorial representation.

Teachers of carpentry and architectural drawing will be glad to learn of the recent publication of a revised edition of *Details of Building Construction,* by Clarence A. Martin. This book is essentially a collection of plates, size 9½"x-12½", presenting only such details, principally in wood, as are in common use in domestic architecture and in smaller public buildings. Appropriate notes of explanation and related matter appear on each plate, rendering them rich in content and easy to read and apply. The drawings have been carefully prepared and represent a great amount of work. They are the result of growth thru a period of years while in classroom use. Beginning with sixteen plates in blueprint form, it has been developed to thirty-three plates in permanent form. The book is a pleasing volume and sells for $2.00.

Here is what an Eastern supervisor says of the *Workshop Note-Book* by George G. Greene.

"I can frankly say it is one of the best little pamphlets that I have picked up along this line since I have been in manual training work. I am quite an advocate of note-book work, especially in high school. I have used the above book for several recitations during the past two weeks and have had very good success with the notes. Having the blank pages in the back of the book makes it very handy for individual work."

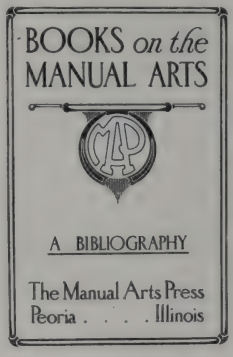
A supervisor in one of the Northern States writes:

"I am convinced that some sort of a textbook should be used in all shop classes, and that the lecture and quiz should be as much a part of the recitation as the work at the bench or machine. Where no regular textbook is used in woodworking, I believe your note-book would be a most satisfactory substitute."

Another supervisor writes:

"I am very much pleased with the workshop note-books purchased from you some time ago and feel that it fills a long felt want."

Teachers selecting reference books and texts for student use will find the 1916 edition of *Books on the Manual Arts* a practical help. This bibliography lists and describes the standard and the best of the recent books of all publishers. It includes books on all subjects in which the manual arts teacher and student is interested. A subject index and an index by the author and title render it an easy matter to locate any title or subject. It is distributed free, and additional copies for normal classes will be furnished upon request.



The new cover design for this bibliography was made by A. H. Saecker, of the School of Fine and Applied Arts, Milwaukee, Wis. This design won first prize in a competition open to students in several of the leading art schools of the country.

The latest book we have seen on vocational guidance is *Occupations,* by Enoch B. Gowin, assistant professor of Commerce, New York University, and William A. Wheatley, superintendent of schools, Middletown, Conn. It is published by Ginn and Company.

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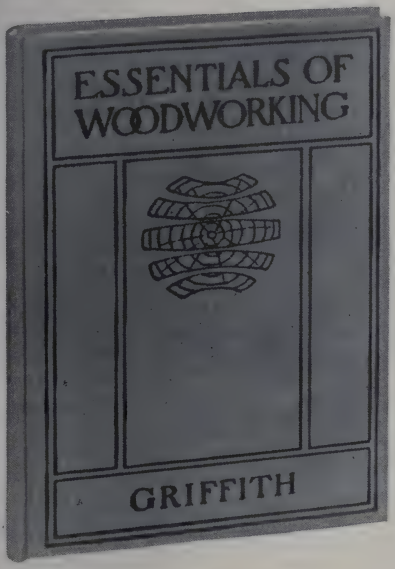
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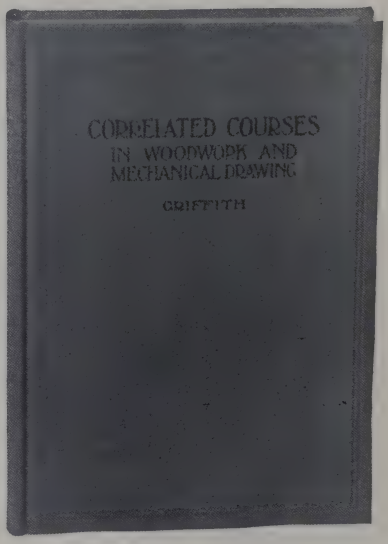
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This book was prepared to meet the great need in high schools and normal schools for a text on the *fundamental principles* of art in dress, millinery and home decoration. It treats the subject in a clear, simple and direct manner and uses illustrations of the simplest and most rudimentary character possible. Its aim is to establish the fundamental principles and make it possible to readily build upon them more elaborate problems without confusion to the worker. It strives to get away from the crude, the loud and the inharmonious and seeks for harmony in our daily life. This book will prove a valuable aid in establishing guiding principles in dress, thus preventing blind obedience to erratic fashions. The subjects treated are as follows:

INTRODUCTION

CHAPTER I. Design Based on Selection and Arrangement.
- Abstract Areas Well Selected and Arranged.
- Underlay Figures as Used in Constructing Dress Designs.

CHAPTER II. Dress and its Relation to the Wearer.
- Dominant Lines of the Costume Should be Adapted to Dominant Lines of the Figure.
- Lines Echoing Length Lines are Especially Good for the Stout Figure.
- Horizontal Lines and Divisions Tend to Modify an Over Slender Figure.
- Every Costume Should Have Unity Either of Line or Color.
- Belts and Tie Ends.

CHAPTER III. Principles of Design Applied to Hair Dressing.

CHAPTER IV. Principles of Design Applied to Millinery. Relation of Trimming to Structure of Hat.

CHAPTER V. Color.
- Theory of Color.
- Color Harmonies.
- Use of Color.
- Color Schemes.
- Areas.
- Outline for Use in Designing a Dress.

CHAPTER VI. Principles of Design Applied to Embroidery.
- Relation Between Decoration and Object Decorated.
- Selection.
- Arrangement of Designs for Sofa Pillows.
- The Use of Color in Embroidery.
- Outline for Use in Working Out Embroidery Designs.

CHAPTER VII. Home Decoration.
- Line Arrangement.
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- Draperies and Decorations.
- Class Exercise.

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A textbook written especially for grammar and high school students. The standard textbook on elementary woodworking. A clear and comprehensive treatment of woodworking tools, materials, and processes, to supplement, but not to take the place of the instructions given by the teacher. The book does not contain a course of models; it may be used with any course. It is illustrated with photographs and numerous pen drawings. Price, 75 cents.

HANDWORK IN WOOD. By William Noyes.

A handbook for teachers and a textbook for normal school and college students. The best reference book available for teachers of woodworking. A comprehensive and scholarly treatise, covering logging, sawmilling, seasoning and measuring, hand tools, wood fastenings, equipment and care of the shop, the common joints, types of wood structures, principles of joinery, and wood finishing. 304 illustrations—excellent pen drawings and many photographs. Price, $2.00.

WORKSHOP NOTE-BOOK—WOODWORKING. By Geo. G. Greene.

A small-size textbook and note-book combined. It furnishes a few general and extremely important directions about tools and processes; and provides space for additional notes and working drawings of exercises and articles which the pupil is to construct. It is essentially a collection of helps, ideas, hints, suggestions, questions, facts, illustrations, etc., which have been prepared by a practical teacher to meet a real need in his own shop. The note-book is full of suggestions; shows a keen insight into subject matter and teaching methods and is an effective teaching tool. Price, 15 cents.

PROBLEMS IN MECHANICAL DRAWING. By Chas. A. Bennett.

A students' textbook consisting of 80 plates, classified into groups according to principle and arranged according to difficulty of solution. It furnishes teachers of classes beginning mechanical drawing with a large number of simple, practical problems which have been selected with reference to the formation of good habits in technique, the interest of the pupils and the subjects generally included in a grammar and first-year high school course. Each problem is given unsolved and therefore in proper form to hand to the pupil for solution. New edition. Price, 75 cents.

WOOD PATTERN-MAKING. By Horace T. Purfield.

A clear, concise treatise on the fundamental principles of pattern-making. It presents the best methods of construction and those most easily understood by the student. It is not arranged about a course of problems but may be used with any course. A practical text for high school, trade school, technical school and engineering college students. Written by an experienced pattern-maker and teacher of pattern-making and kindred subjects. New edition. Price, $1.00.

PRACTICAL TYPOGRAPHY. By George E. McClellan.

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AFTER HOURS

ANGELS OF SERVICE.

AT the meeting of the Vocational Association of the Middle West, Alfred Fletcher, of Rochester, N. Y., told a story worth telling again. We think we shall be forgiven for retelling it, and at the same time applying it to suit ourselves:

A merchant and his wife went to the great exposition. On Monday morning, after the supposed manner of husbands and wives, he agreed to go to the art gallery with her on Friday afternoon, and she was to spend three-and-a-half days going with him to the races and to see the machinery and merchandise.

In due course of time Friday afternoon came, and the wife joyfully conducted her husband to the art gallery. At first he was much bored; he saw nothing to interest him; but presently he came upon a picture of a foot-bridge crossing a deep gully, below which was a whirling torrent. One of the rails on this foot-bridge was unfastened at one end and fallen down. Coming across the bridge was a little child; between the child and the fallen rail stood a beautiful angel guarding the child as he passed the break in the railing.

The picture touched the merchant's heart. He was so impressed that on the following morning when he and his wife went to the exposition he led her at once to the art gallery and went directly to this same picture. He was standing in front of it, and musing over the story of child protection which it told so beautifully, when his thought was interrupted by a farmer from Indiana who, also, was being taken thru the gallery by an art-loving wife. The farmer looked up at the picture for a moment and then remarked "Why don't that fool angel nail up the fence and go back to her work?"

Here endeth the story, but your thoughts cannot end here. They will have to go on. You are shocked to have an angel characterized by such an adjective and by the suggestion that an angel should do such a menial and mundane thing as to repair a fence. Your idea of an angel was gained from a Fra Angelico fresco and from the song you used to sing:

"I want to be an angel,
And with the angels stand;
A crown upon my forehead,
A harp within my hand."

But why not a repair angel as well as a guardian angel? It would certainly be economical to have such, for if a guardian angel were to accompany every child passing a dangerous spot in these days, the heavenly host would be kept very busy. Under the new organization of angel service a few angels could repair not only fences but laws as well; they could repair the hearts and habits of vicious men and women, and could close the door of temptation, they would be especially valuable to humanity just now. The farmer was right; we need a new kind of angel to meet modern conditions.

The angel with peaceful face and shining garments that chants the heavenly anthem and plays on a harp of gold, that goes on errands of blessing and good cheer, will always be needed, even when the perfect day has come, but the wicked world needs another also, an angel of service. This one should be strong and knightly in bearing, penetrating in thought, with the strength of ten, the skill of a hundred craftsmen, and the spirit of the Master himself. Such angels this modern world needs to keep it in good repair.

YES, repair the fences and then give the boys a chance to live as real boys. The story is told of some boys in a great American city who wanted to find a place to meet for the practical study of civics and citizenship. They applied to the superintendent of schools who referred them to the school principal, who, in turn, referred them to the janitor, who refused because he was a "union man" and lived some distance away. Then they applied for a vacant police court room and received the answer, "I can't approve a plan to make boys familiar with police stations. The less they know about police stations the better for them." Is this the way to train up American citizens?

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MANUAL TRAINING AND VOCATIONAL EDUCATION

JUNE, 1916

MOVING PICTURES IN INDUSTRIAL EDUCATION.

ALBERTA M. WOLGAMOTT.

THE final test of an invention is its contribution to the larger life of mankind. Viewed from this standpoint the moving picture has already justified itself. It has opened an avenue to wholesome amusement, added to our fund of information concerning many facts of our common every-day life, increased our knowledge of peoples and lands, made us better acquainted with the classics, and is a constantly active force in teaching higher ideals in personal as well as in national life. When it is remembered that from seven to twelve millions of men, women and children daily come under the influence of this "peoples' school," its future educational possibilities at once seriously engage our thought.

In a study of the use of the moving picture in connection with the teaching of industrial processes, a number of problems incident to this method of instruction present themselves. In the first place, one learns anew that every movement in the direction of progress suffers from the claims of its over-enthusiastic advocates. When the value of the motion picture as an educational agent was first emphasized, Mr. Edison gave expression to the following rather disconcerting prophecy: "Books will soon be obsolete in the public schools. Pupils will be instructed thru the eye. It is possible to teach every branch of human knowledge with the motion picture. Our school systems will be completely changed inside of ten years."

This burst of enthusiasm found followers who were ready to go on record thus without any reservations. As is always the case, the wise conservatism of the thoughtful is proving a balance wheel. It is true

that the motion picture has now, and will have more and more, a place in our methods of education, but it is also true that up to the present, at least, it possesses certain well-defined limitations. Everyone appreciates the power of visual instruction, but instead of supplanting books, its highest use will be rather to supplement the printed page.

The chief difficulties that confront us in teaching industrial processes thru the motion picture are (1) the lack of films that are really educational, and (2) the securing of a projecting machine at a reasonable price that will permit the stopping of the machine at any point to clarify the explanation. In discussing the present needs along these lines, Dr. Joseph M. Jameson, vice-president of Girard College, who has had experience in the use of motion pictures for educational purposes, makes the following observations:

> I believe that the moving picture might be made of very great value in educational work if the reels could be made purely educational. My observation has been that those films furnished gratis by manufacturing concerns are occasionally "posed" for the benefit of the firm rather than for the display of normal manufacturing conditions. Again, a good bit of space is devoted to advertising features. This is entirely right and proper, of course, where films are furnished gratis; it is an advertising proposition and so recognized. But to make the films really valuable in a large way they should emphasize phases of the industry which are most educational. Again, there must be some scheme by which these films may be secured at the time when they best supplement the other school work. If they could be introduced from time to time just as lantern slides belonging to the school are used, they might be enormously valuable.
>
> Again, if a film could be used which could safely be stopped at any point, leaving it on the screen as a slide while certain features shown are discussed, it would add greatly to the value of the method. Of course, I know something of the difficulties which would be involved in meeting these suggestions and also something of the expense involved, but I believe we here touch upon the chief disadvantages of moving pictures where they must be rented from the regular supply house or obtained from manufacturing concerns. If each school might enjoy an adequate service of supply so that it could obtain non-flammable films as desired, at a time when they are most needed, and if a projection outfit could be designed for these films which would permit them to be used as slides, I think a most helpful agent in instruction would be introduced. I have the impression that a really adequate solution from the educational side would be to have some committee work out a really satisfactory projection equipment and films and system of distribution (if possible), and then put the matter up to manufacturers to produce the equipment.

An authority in the field of instruction thru the eye is Dr. A. W. Abrams, chief of Visual Instruction Division, University of State of New

York, who also has been closely studying this whole subject. In the following comments he has touched upon some vital points involved in motion picture instruction:

> The success of instruction thru any pictures whatever depends upon an observation of the laws governing the act of observation. It is not merely a question of presenting something to the physical eye, but the pictures thus presented must be calculated to show most effectively the essential objective characteristics of the objects presented. These clearly include size, form, position, arrangement of parts, and in some cases color, and in some cases motion. In addition to these there must be secure and adequate mental reaction to what is presented. It seems quite certain that to secure these results the picture must be analyzed and discussed. Comparatively few people have learned how to observe either things themselves or pictures of things. Taken in connection with the careful study of still pictures and accompanied by reading and discussion, the motion picture films ought to yield some good results.

The foregoing may seem conservative statements, but it must be borne in mind that there is a difference between viewing a film for pleasure or general information and viewing it for a knowledge of sequential industrial processes. The former may easily be done, but it is the latter that really tests the educational value of the film. Furthermore, it is only by definitely stating the needs that yet remain to be met before the highest educational use of the motion picture is our heritage, that the perfection of the machine will be realized. Those who give sufficient thought and time to the study of the subject to enable them to point out the weak places, are contributing to this desired end, and we can safely leave to the inventor the successful solution of the problem. Pending the perfection of a projector that will meet all requirements, it is encouraging to observe the efforts which are being made by manufacturing industries to strengthen the teaching of industrial processes by the use of motion pictures of their own plants. Many of these films can be secured direct, but for the most part the Bureau of Commercial Economics, Washington, D. C., with the extension departments of the different universities acting as cooperators and distributors, is serving as a clearing house for educational films of all kinds. This organized method of handling and routing films assures a service not otherwise obtainable. The list of subjects covered includes mining of all kinds, agriculture, horticulture, forestry, animal industry, commerce and transportation, industrial processes, health and public welfare, and social service. Any organization which desires to use the films of the Bureau, thru the

medium of the cooperating universities, may have the privilege under the following stipulations:

(1) Payment of transportation charges from and to the distributing center.
(2) The films shall be used on standard motion picture projectors, handled by competent operators.
(3) A report of films used and attendance shall be mailed after each performance to the distributing center.
(4) Films shall be returned immediately after use.

No fee whatsoever is charged or accepted for the use of the films of the Bureau, and no admission fees are permitted to be charged, nor are collections during or after the exhibition permissible. Applications for the service must be made on the regular application blank furnished by the Bureau. For large audiences the Bureau will provide, without expense, special lectures on current subjects, travel, industry and banking.

Organizations and institutions that do not own a projector will be interested in learning how this need has been met by the public schools of Kalamazoo, Michigan. Professor George S. Waite, director of manual training, secured the cooperation of the manager of a local picture house who placed the theatre at the disposal of the schools for two performances every Saturday morning. The theatre seated 300, and thus 600 students from the public schools and the Western State Normal School were given an opportunity each week to view films illustrating various processes of manufacture. The films were classified as to their adaptability to boys and girls, and tickets of admission were distributed to the students for which the particular film to be shown would be especially helpful.

Teachers of manual training, vocational and industrial education are indebted to E. C. Schiele, director of the educational department of Henry Disston & Sons, Philadelphia, for compiling a list of the manufacturers having motion picture films of their plants, the use of which can be secured upon request. The list, which he has freely distributed, and which is constantly growing, now numbers between 75 and 100, and a copy will be mailed to anyone interested. Mr. Schiele is also compiling a list of educational institutions and public school systems having motion-picture machines, to each of which he mails a list of the educational films which can be secured. In this way many machines are being put to work that previously were idle owing to a lack of information concerning available films.

An interesting development of the use of motion pictures of a given plant among the employes themselves, has been worked out by the Packard Motor Car Co. They use motion pictures of their factory to acquaint the men in each department with the actual operations that go on in other departments with which they are not familiar. In this way a man learns what becomes of the individual parts that he works on. This is accompanied by a talk covering the various points shown by the film which the firm desires them to bear in mind. The value of this will be readily appreciated and it should prove suggestive to other firms.

In this consideration of the place of the moving picture in industrial education, it has not been the purpose to try to determine definitely its future possibilities. To acknowledge its present limitations is only to prophesy its more complete development. This has been the history of every invention. The motion picture is the nearest approach to life itself, and there is reason to look forward with expectancy to its increasing influence in modern education.

THE INCREASE OF FOREIGNERS, WHO DO THE SO-CALLED DRUDGERY, HAS TAKEN FROM THE HANDS OF THE MALE POPULATION OF THIS COUNTRY, THE SOURCE OF THEIR FOREFATHERS' STRENGTH—THE STRENGTH ON WHICH WAS FOUNDED THE NATION. GREAT NATIONS HAVE BEEN AND ARE THE PHYSICALLY INDUSTRIOUS ONES.—Raymond Riordon.

HIGH SCHOOL WOODWORKING: GETTING THE PUPIL STARTED ON HIS JOB.

CHARLES W. CLARK.

THE student coming from the grade school has acquired a certain ability to use the right tools in the right place and also a certain elementary, but necessarily unorganized, knowledge of materials and methods of construction. In the more advanced work with more time at his disposal, he will go deeper into the processes of cabinet-making by working on bigger jobs. At the same time the opportunity comes for him to organize the knowledge that he will work out on the job, so that he may know in the future how to meet the problems that will come to him.

The study of subjects pertaining to woodworking will best parallel as far as possible the operations in the shop. However, the shop job cannot wait on the textbook work. Therefore before the latter is taken up in detail it is wise to give the boy a grasp of fundamentals to get him started right. This will develop a spirit of independence on the boy's part and make unnecessary so many often foolish demands on the teacher's time. The teacher can do much more efficient work if he can limit the number of pupils waiting to ask what to do next. This article outlines some of the important fundamental principles for the pupil's guidance.

SHOP RULES.

I. An efficient start will be made by acquainting each student with a set of shop rules. In Syracuse each bench is numbered and its corresponding bench tools. Each tool from the general panel has its place and each student is furnished a locker for apron and work in process of construction. Each individual boy has his own double irons for jack-plane and smooth-plane. A well defined system here will give him an impetus toward a spirit of neatness and order in his daily life. These rules would acquaint the pupil with the system and would include such other suggestions as the disposition of oily waste, what machinery he may use and when; or rules which may be required by local conditions. Now he is ready to begin his job.

II. The first essential, of course, is the ability on the part of the pupil to read a drawing. Accordingly two or three days during the

first week will be profitably spent in putting the classes thru a stiff drill in blueprint reading. Here the following points will be emphasized: (1) How the working drawing differs from the perspective drawing. (2) Purpose and meaning of the three-view drawing, including demonstration of the three planes of projection commonly used, by means of three frames. (3) Scaling the drawing. (4) Reading dimensions.

Each student will then prepare a freehand working sketch of his job, or, if the class is to work on the same job or a school job, a study of the prepared drawing will be made. The writer believes that too thoro a study of the project in the beginning cannot be made. It will aid the pupil immeasurably to have the plan fixed in his mind at the start. The making of a complete bill of stock will accomplish that for him. He must be taught to make out this bill of materials systematically from the drawing, locating the position of each part in his mind picture of the finished product.

III. The bill of stock completed, a few suggestions to guide his selection of material will be advisable. The final disposition of the piece of furniture in the home must be taken into account. The variety of wood having been selected, the following will guide him in cutting the stock:

(1) Avoid blemished stock, cut clear of worm holes, bad knots, decay, and bad checks, for outside stock especially. (2) Match the grain wherever possible. (3) Cut economically; use short length stock if you can, and have as little waste as possible when cutting from a board. (4) Allow ½" extra on length and width and enough on thickness to dress the surfaces smooth and flat. (5) Get out first all pieces where similar joints are to be cut or similar shaping to be done. Shelves, tops, and broad stock can be left till later unless needed in the first assembling.

DRESSING UP THE STOCK.

IV. Some information concerning the proper method of dressing stock is now essential:

(1) Finish stock to exact size called for in the bill of stock. (2) Put your jack-plane in condition before doing any planing. (a) Grind a bevel which in width is twice the thickness of the cutter. The cutting edge must be slightly crowned in the middle. (b) Whet the cutter on the oilstone first on the beveled side at a greater angle and then flat on the other side to get rid of wire edge. (c) Set the cap iron back $\frac{1}{32}$"

from the end of the cutter. (d) Adjust cutter for light shavings only. (3) Have a certain plan in dressing stock; a little systematic work at the beginning will save mistakes later. The following is a good method: (a) Dress one broad surface smooth and flat. (b) Plane one edge straight and true and square to the first side planed. (c) Put some mark on these two faces which will tell you later that these are true. (d) Square one end to these two sides and mark it also. Then if the piece is to have joints laid out and cut on it leave the other end rough; otherwise, measure exact length and square this as well. (e) Now gage the piece the correct width from the marked edge, and plane to the gage marks. Smooth also the other broad surface. (4) Work wherever possible from a common starting point—a very important cabinet-making rule. (a) In dressing stock the start is made with one true surface; to this, one edge is squared; and to these two, one end. (b) These three faces are marked, and all future measurements, squarings, and gagings should be made from these three only to avoid error.

V. When the stock is all dressed to size, and the pupils are ready to lay out the joints, the instructor will make a class demonstration of the mortise-and-tenon joint. Then with the following notes in the hands of the pupils he will be free to do individual work with the boy who is working with housed or dovetail joints. These pointers will aid the beginner who is working on a framed structure of any form.

THE MORTISE-AND-TENON JOINT.

(1) Size of tenon determined by the thickness and width of mortised piece. The tenon must be big enough for strength and yet not so large as to weaken the post or stile by necessitating a large mortise. The following suggestions may help: (a) Where stock is ¾″, ⅞″ or 1″ thick, use tenon ⅜″ thick and ¾″ deep for 1½″ post or stile; 1″ deep for 2″ post. (b) Use ½″ tenon for heavier stock, and cut from 1″ to 1¼″ deep.

(2) Lay out all similar tenons at the same time. (a) Plan to have your working faces out and working edges (the ones marked) up. (b) Use knife and gage only to lay out joints, as the lines are thus more clearly defined. A pencil should be used only where the lines will not work out. (c) Lay out with knife, and square from working surfaces, the tenon lengths on the squared end of each rail. In finding shoulder line of tenon at the other end of the piece measure from this first shoulder line, the distance between the posts or stiles. (d) Make the

outside shoulder shallower than the inner to throw the tenon nearer the outside, if there are two rails meeting at right angles. Therefore in gaging this outside face of the tenon set the gage at $\frac{3}{16}$″ and gage clear around from shoulder line to shoulder line, doing all the gaging for that distance at once. The second gaging will be $\frac{3}{16}$″ plus the tenon thickness, say $\frac{3}{8}$″, and this must be gaged from the same working face.

(3) Mark out mortises corresponding to the tenons. (a) Plan to have similar grain of posts on the same side of the job. Mark clearly in the beginning the faces of the posts opposite in the job and which are outside, front, or back. (b) On small posts plan to put the mortise about $\frac{5}{16}$″ from the outside face of the post to prevent the meeting of the tenons. (c) Lay out the mortise lengths from one end of each post only. (d) Gage mortise width between these two length marks only, gaging both lines from the same side of the post..

VI. Cutting the joints.

(1) Cutting the tenon. (a) Saw with back-saw across the width of the tenon and $\frac{1}{32}$″ outside the shoulder line. Do not saw below the gage line showing the depth of the shoulder. (b) Saw from the end toward the shoulder, also outside the gage line. Thus the tenon is roughed out. (c) Smooth each face of the tenon by chiseling across the grain. (d) Chisel back to shoulder line testing whether square to face edge. Undercut slightly to insure good fit at shoulder. (e) Now if tenon is not to be full width of the rail the required shoulders may be cut from one or both edges of the tenon.

(2) Cutting the mortise. (a) Gage a line midway between the two sides of the mortise. (b) Bore a series of connecting holes $\frac{1}{16}$″ less than thickness of tenon and $\frac{1}{8}$″ deeper than tenon length. (c) Chisel out the remaining wood. Here use chisel across the grain at first to avoid splitting and do not pry chips out against the edges of the mortise. (d) Trim tenon and mortise to final size and fit them snugly so that they may be pushed together by hand. Do not use mallet to drive them together. (e) Mark each tenon and corresponding mortise. (f) The faces of the tenon and the mortise must be close against each other or the glue will not do its work. No amount of glue filling will overcome a loose fit.

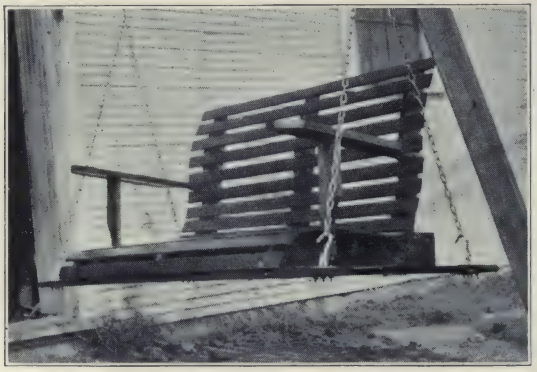
GLUING UP.

VII. The writer has found that a few pointers on the very important matter of gluing up are of inestimable value to the pupil and will save much future trouble.

(1) Preparing for assembling and gluing. (a) See that all joints are laid out and cut, and that all pieces requiring shaping are finished. (b) Now is the time to get all surfaces ready for the stain. Smooth-plane all surfaces and edges to a final smooth finish; remove any rough spots due to irregular grain with scraper plane or hand scraper; sand all surfaces with No. 1 sandpaper on a block, removing raw corners of posts and rails.

(2) Gluing with hot glue. (a) Take the job a section at a time; it is difficult to glue a big job all at once successfully. (b) If possible warm the stock before gluing. (c) Have clamps all set and ready. (d) Glue must be about as thick as cream, and it must be hot. (e) Apply glue to both mortise and tenon or to both edges of an edge joint. (f) Assemble as quickly as you can and clamp before glue cools and sets. (g) The secret of good gluing is to have the hot glue penetrate the pores of each piece, forming innumerable little tenons, binding the two faces together. (h) If joints are well made and clamps are applied parallel with the rails, a frame should be true when glued. It is best to test it, however, and if the frame is not true adjust the clamps while the glue is still hot and soft. Once hard the form is fixed.

It is not intended of course to substitute these notes for demonstrations by the instructor, nor for the detailed textbook work; but with these suggestions in the hands of the pupils, it will organize more easily the beginning of their high-school cabinet-making, and the textbook work can be gone over in a more leisurely and effective manner.



A COMFORTABLE PORCH-SWING MADE IN THE MANUAL TRAINING CLASSES OF THE PRATT HIGH SCHOOL, PRATT, KAN., F. L. REYNOLDS, INSTRUCTOR.

A MANUAL TRAINING COURSE WITH AN INDUSTRIAL PURPOSE.

A. W. Garritt.

AS an element of liberal education, it is part of the function of manual training to aid in terpreting the industrial world. The industries are the foundation of our institutions, and they constitute the most essential activity that man engages in. A study of these activities is certainly important enough to be given a place in the curriculum. We are coming to believe that they are the most logical and

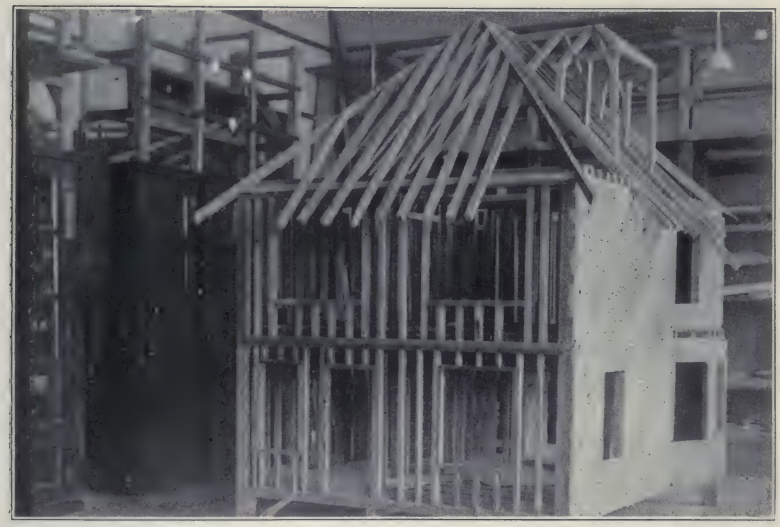


FIG. 1. BUILT BY BOYS OF P. S. 45 BRONX, NEW YORK CITY.
PHOTO BY JOHN D. HANEY, PRINCIPAL.

proper subjects around which to build a course of study in shopwork for the elementary and high schools.

The purpose of such study should be to give a general industrial knowledge or insight. The subject-matter should deal only with the most typical features of the more important industries, and the aim should be to develop a broad, sympathetic appreciation of many phases of industrial life, and of their relation to the social world. The method of study should be one of participation. "It should consist of actual

experience in productive activity as contrasted with mere information getting." Only in this way can the school shopwork be made an aid in interpreting the industrial world.

If we agree that one of the large purposes of the school shopwork is to furnish general industrial experience, we must adapt the course of study to this purpose in several particulars.

The things made should be selected for their industrial meaning. Anything that has no value in this regard is to be discarded. This



FIG. 2. FENCE ABOUT SCHOOL GARDEN, BUILT AND PAINTED BY BOYS OF P. S. 22, QUEENS, NEW YORK CITY. FRANK LATHAM, INSTRUCTOR.

should be the test: "Has the problem the maximum of industrial meaning?"

Things have industrial meaning when they illustrate typical forms of construction. Therefore, only typical forms of construction should be employed. For example, a bracket shelf has more structural significance than a match box. The bracket and brace are widely used in construction in wood, iron and stone. A taboret built as a table has more structural meaning than the other type so common in the school shops. It is more typical. It is a form of construction of wide application in furniture building. Things have industrial meaning that represent the various mechanical devices, as water-wheels, derricks, looms, telegraph apparatus, etc. Finally, all forms of structures, as houses, bridges, towers, boats, etc., have industrial meaning.

All these types of problems will help to add an industrial content to the shopwork. A well balanced course, however, should not exclude entirely, problems that develop the craftsman's spirit with his love of good proportion and appropriate design; but the emphasis should be laid on the industrial bearing of all problems, and a fair proportion should be selected for their industrial significance alone.

A second adaptation must be made in the course of study to fully carry out the purpose of giving a general industrial knowledge. Provision must be made for gaining experience in working with more than

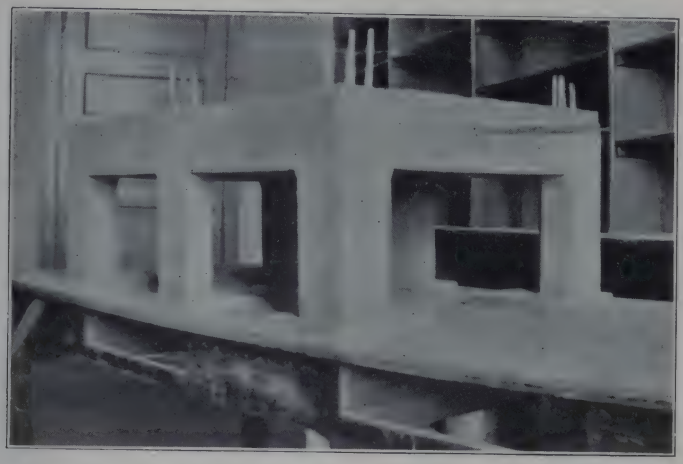


FIG. 3. STUDY IN CONCRETE CONSTRUCTION, BY BOYS OF P. S. 89, QUEENS, NEW YORK CITY. HALL CHRISTIE, INSTRUCTOR.

one material, and of learning thru actual practice the more typical uses of each. Some work with cement, some exercises in beating, bending and soldering thin metal, and some problems in molding and casting should be undertaken.

In a manual training course with an industrial purpose, then, the things made should be selected for their industrial meaning and for the opportunity they afford for working in a variety of materials. A general industrial knowledge, however, implies a knowledge of industrial conditions, as well as a knowledge of construction and materials. There are two phases of industrial organization that can profitably be illustrated in the school workshops. They will help the pupils to understand the conditions under which production is carried on in the practical world outside of the school.

The first of these is the factory system. The typical features of this are the division of labor and the use of automatic labor saving de-

vices in the form of jigs and special machinery. Both of these features furnish valuable experiences when carried on in a school workshop.

Before starting on a factory problem, the boys ought to be told something of the economy of time and effort that comes from working in this way. The question of jigs should also be a matter of discussion, and both teacher and boys should use their ingenuity in inventing all the devices possible to insure an accurate product with the least amount of effort.

To successfully carry on an exercise of this type requires careful

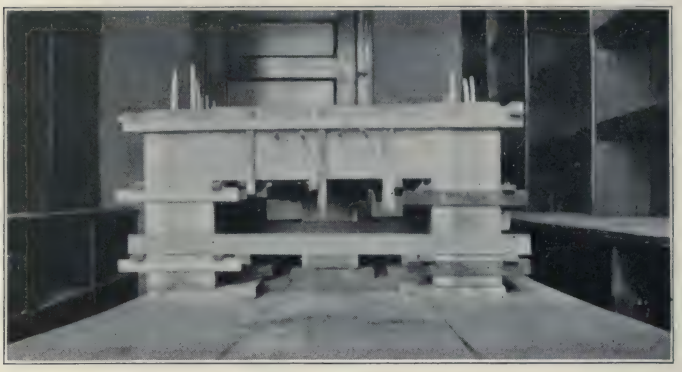


FIG. 4. STUDY IN CONCRETE CONSTRUCTION BY BOYS OF P. S. 89, QUEENS, NEW YORK CITY. HALL CHRISTIE, INSTRUCTOR.

planning and skillful organizing. There should be no congestion and no waiting. The number of boys on any one stage of the process should be increased or diminished if need arises, so that the work will progress from the rough stock to the finished product without any interruption. A foreman should be appointed to look after this, to pass on the work of each group, and to check any carelessness resulting from undue haste. The objection is sometimes raised against such an exercise, that the boys are kept too long on one process. This drawback is overcome by changing the groups from one process to another each period.

There is another consideration necessary to the success of the factory problem. "What shall the product be, and how shall it be disposed of?" It will add very much to the reality of the problem if the product can be sold. This can be accomplished in an indirect way by making things for the school or the supply department of the city school system, and receiving in return additional allowance for shop material. Even when this is not feasible, an occasional exercise of this kind is worth while for the insight it gives into practical industrial conditions.

The second phase of industrial organization that can be illustrated in a school workshop is what might be termed group or gang work. It is the type of organization that maintains in all construction work where a number of mechanics of different trades and varying degrees of skill work together under a foreman and superintendent in the erection of a large structure. To carry this plan out in a school workshop, some large pieces of work should be undertaken each year; projects which



FIG. 5. LOOM BUILT BY BOYS OF P. S. 16, RICHMOND, NEW YORK CITY. GUSTAVE OBERGFELD, INSTRUCTOR.

illustrate typical forms of construction and will, therefore, have an industrial content that is worth while aside from the insight they give into industrial conditions. The following problems answer these requirements:

A one-room, one-story house, large enough for boys to get inside to do the necessary sawing and nailing. Model bridges of concrete, iron or wood. Looms, boats or large furniture for the school. Here again, if the problem can be of some use, it will have greater value.

These two types, the factory and the group problems, will add a socializing element to the shopwork that the individual problem fails to give. They will develop an appreciation of industrial conditions that can be gained in no other way except by actual work on the job. In addition, they tend to give the pupil a sense of responsibility in his work. He can be made to feel that the success of the whole undertaking depends upon the care with which he does his part. These elements constitute the value of this type of work.

In order to carry out a plan of work as outlined thus far, we will

have to change the prevalent notion as to the relation of skill to manual training. We shall have to agree that the emphasis shall be placed on the thought or content side, and that skill shall be looked upon only as the medium of expression. We shall have to agree, in the general manual training course, to select the problems for their value in illustrating some phase of industrial life, leaving the development of a high degree of technical skill to the vocational and trade schools. This does not mean that the element of skill is to be neglected; it should play a parallel part to language, which is the medium of expression in other forms of study. Modern educational theory teaches:



FIG. 6. PLASTERED PARTITION UNDER CONSTRUCTION IN P. S. 23, BRONX, NEW YORK CITY. HENRY NEWMAN, INSTRUCTOR.

1. That thought and power of expression are closely inter-related and that they should be developed simultaneously, not separately.

2. That thought is the more important elements, and that power of expression, tho important, is only an aid to the latter.

3. That power of expression should be developed only as called for by the thought.

This relation of thought to the power of expression indicates the place of skill in manual training. If we accept this view, we will be led to adopt labor-saving devices to relieve the pupils of the drudgery of preparing material by hand, after they have done enough of it to know *how* it is done. After the first term or two, mitre-boxes, chute boards, trimmers, drill-presses, foot-power or electrically driven saws, planers or lathes should be employed to facilitate the work of preparing material. If this is done, more time will be available for the study of construction and other industrial problems; more time will be available for the development of the thought content. A knowledge of the use of these machines will also contribute an element in the general industrial insight that we are striving to develop.

The foregoing considerations for the selection of problems and the methods of carrying them on are the essential considerations that should govern the planning of a course in shopwork with an industrial purpose.

There are other features, however, which, while not actually part of the course of study, will aid greatly in accomplishing our purpose of giving boys a general industrial knowledge. One of these is the systematic visiting of industrial establishments, and the inspection of important bits of construction that may be going on in the neighborhood. Teachers find no difficulty in getting permission to take a small group of boys at a time thru the several factories in a neighborhood. Where this has been tried, the increased interest shown by the boys in all industrial problems has more than repaid a teacher for his trouble.



FIG. 7. BUILT BY BOYS OF P. S. 45, BRONX, NEW YORK CITY. PHOTO BY JOHN D. HANEY, PRINCIPAL.

Another device to aid in fostering interest in industrial things is the establishment of a shop museum. It should consist of models of mechanical and electrical devices, typical forms of construction; materials of manufacture; samples illustrating processes of manufacture. Also a shop library of popularly written books and magazines on mechanical and structural subjects will aid in developing this interest.

To summarize: The essential features of a manual training course, with an industrial purpose, are as follows:

1. All problems must be selected for their industrial significance. 2. Opportunity must be provided for work in more than one material. 3. The factory and the group systems of production should be illustrated. 4. Labor saving machinery should be employed. 5. Visits to factories and construction work should be systematically made. 6. A shop library and museum should be maintained.

THE EFFECTIVE USE OF THE SCHOOL FARM: A RECORD OF AN UNFINISHED EXPERIMENT.

ROBERT J. TEALL.

IN the whole category of stupid adages, there is none more stupid than the ancient saw—"Experience is a dear school; but fools will learn in no other." If they are fools who prefer to leave the worn paths of accepted practice and go exploring afield, the Gardena Agricultural High School feels a quiet satisfaction in being of that company. This article is a brief account of an excursion undertaken by that school in an attempt to find the most effective way of using the school farm as a tool of agricultural education.

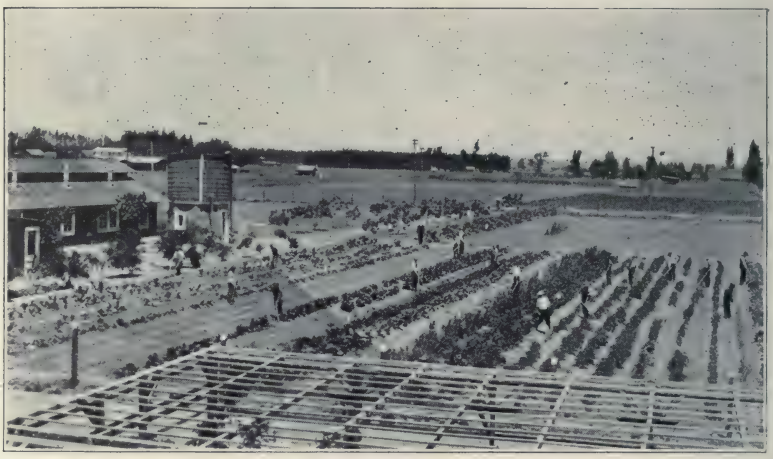


FIG. 1. PLANT PROPOGATION CLASS IN THE GARDEN.

The Gardena Agricultural High School is a part of the Los Angeles city system. It is located fourteen miles from the center of the city, with excellent facilities for transit. It has enrolled at present about seventy boys in its agricultural course, and fewer than twenty of them are country-bred. Most of its students live at home, and few of them have ground available on which to undertake home project work. The school has about fifteen acres for agricultural use. It is a cosmopolitan high school, with an agricultural course, and the time schedule of the

boys in agriculture must to a certain extent keep step with that of the rest of the students. When the school was made an agricultural high school in 1910, there were few precedents for it to follow in its agricultural course, and exploration became the order of the day. But limits were placed on all excursions by the conditions just mentioned, and the excursion into the unknown region called "The Effective Use of the School Farm" was no exception to the rule.

The school in the beginning departed little from the traditional. The course included agricultural subjects in each of the four years, but they



FIG. 2. SOIL TESTING.



FIG. 3. SPRAYING.

were handled much as the well-established science subjects had been handled up to that time. Some field work was done by the boys in the various courses, but most of the work of the farm was done by a farmer, employed for that purpose. The school was operating with forty-five minute recitation periods, double periods of ninety minutes daily being allotted to the agricultural subjects. It was found that even with the best intentions in the world on the part of pupils and instructors it was impossible to accomplish anything of importance in the field with the time allotted. The boys would get on their overalls, get their tools, go out to the field, and overcome the inertia incident to the beginning of a new task; by the time all this had been done it became necessary to begin going thru the reverse process, in order to get back to the next recitation. A change in procedure was clearly indicated.

We faced two alternatives. One was to abandon the practice work

on the farm, which meant abandoning the farm, and confine ourselves to theoretical work in agriculture. The other was to give the boys more consecutive work in the field, even tho the total time in the field was not increased. The first alternative was not to be considered for a moment. We adopted the second. In the ninth year we offered farm carpentry and plant propagation on alternate forenoons, each for three consecutive hours. In the tenth year we organized the schedule in the same way for blacksmithing and poultry-dairy, and made similar ar-



FIG. 4. LEVELING FOR ALFALFA.

rangements for the eleventh and twelfth years. Under this plan the boys get three consecutive hours daily in field or shop.

The plan has worked. Satisfaction with it is general among teachers and pupils. The students are able to do effective work on the farm, under conditions that approximate real working conditions. They are able to maintain interest in the outdoor work because they work with less interruption. As soon as the plan had been under trial long enough to make these results evident, it was possible to take another step.

APPROXIMATING FARM LIVING CONDITIONS.

By 1914 the farm had been stocked with cows, pigs, and chickens, in addition to a team of horses. But many of our boys had never milked a cow, and most of them had never done farm "chores." Since they were with us only from nine to three-thirty, we could give them little opportunity for that sort of work. It was evident that something

was needed to remedy the situation. Accordingly a dormitory plan was put into operation.

During the summer of 1914 the farmhouse was so remodeled as to provide additional sleeping-rooms. The farmer was released, and the head of the agricultural department, with his wife, moved to the farm house. When school opened in September, four city boys, twelfth year students, were chosen to occupy the dormitory. The school gave them board and room, and in return they did all the miscellaneous work of the farm, before and after school hours, and on Saturdays and Sundays.



FIG. 5. CLASS IN DAIRYING.

Since then, a new set of boys has been chosen each half-year, so that eight boys have been enabled to share the experience each year. The plan has been so successful that the school hopes to enlarge the dormitory in the near future, so as to include quarters for at least six boys at a time.

The apportionment of more consecutive time to field courses and shop courses, and the added opportunities offered to twelfth year city boys by the dormitory plan, gave us a large measure of satisfaction in the use of the farm. We have recently devised a change in our course of study which is helping us still further to utilize it effectively.

Until recently, in the ninth year of the agricultural course we alternated plant propagation with farm carpentry; in the tenth year, blacksmithing with dairy-poultry; in the eleventh year, horticulture,

agronomy, and animal husbandry formed a triple alternation; each of the subjects in the combinations being given for three hours on alternate mornings or alternate afternoons. We found, however, that the work of the farm had a habit of refusing to follow the daily schedule of classes that we had laid down. For example, the cow-yard needed cleaning, and only the horticulture class was available to clean it; or a piece of plowing needed to be done, and conditions were such that only the animal husbandry group was available for the work. We could, of course, set them at it willy-nilly, but to do so inevitably started some



FIG. 6. BUILDING A GARAGE.

grumbler at work, and a little tension sometimes developed. Accordingly, in the tenth and eleventh years we are now offering courses called "field practice," in which the boys do on the farm that particular piece work which is most urgent. It may be horticultural, it may be related to animal husbandry, or it may be mowing alfalfa. We still offer courses in horticulture, agronomy, dairy-poultry, and animal husbandry. The courses thus named are now largely textbook courses, and they are all related to the general course called field practice.

The classes in farm building construction have from the beginning turned the farm to good account. All the building that has been done on the school premises has been done by successive student groups. With the assistance of two carpenters, students have constructed a good-sized barn. Working alone, they have erected a dairy building, a garage, a

wagon house, a small house for an acetylene gas generator, a blacksmith shop, and other small buildings. They have built fences, they have done cement work, they have done a large amount of plumbing, and they have made repairs as they were needed.

With these larger problems in the use of the farm in process of solution, other minor problems have presented themselves. Among them the question arose whether the farm and garden should be divided into individual plats, or whether the work should be done on the group plan. The answer to the question has included a combination of both



FIG. 7. BARN BUILT BY THE BOYS.

elements. The garden work of the class in plant propagation is individual work. This class also has charge of all the ornamental plants about the school premises, and of the greenhouse and lathhouses, and this work is as far as possible individual, each student assuming responsibility for a definite portion of it for a period of weeks. The dormitory boys in the twelfth year are given similar individual responsibilities. In other outside work, including farm building construction, the group plan has in general been found more successful than the individual plan. It will be understood, of course, that the chief difference between the group plan and the individual plan lies in the length of time that one student is held responsible for a given piece of work.

A word should be said regarding the disposal of the product of the farm. From the standpoint of the man who is making his living as a

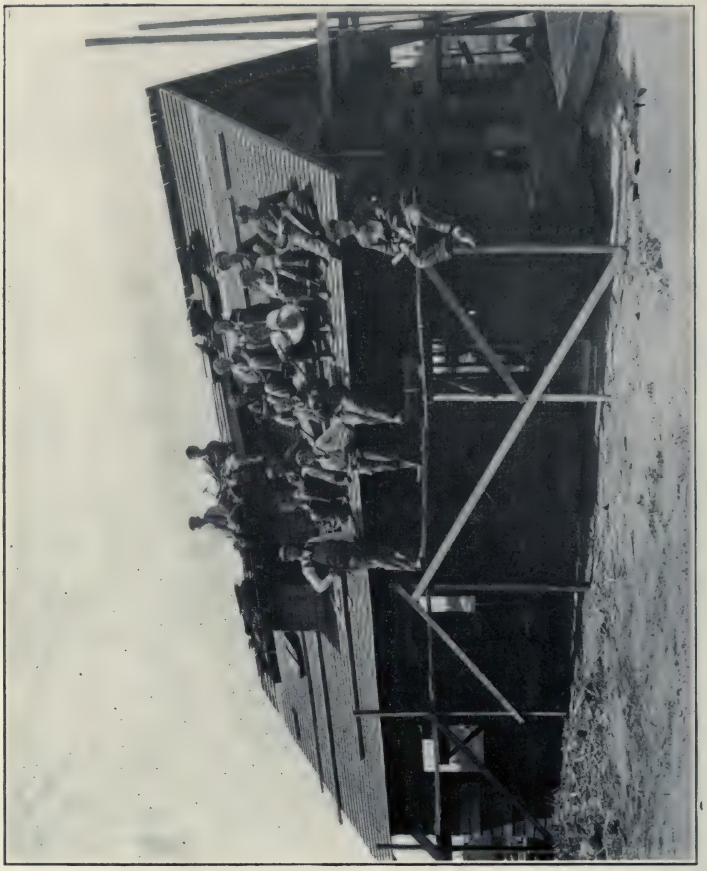


FIG. 8. AT WORK ON A BARN.

farmer, there is waste in our farming operations. But the waste is not great. The cafeteria of the school is our best customer for vegetables, milk and eggs. Our pure-bred pigs are in brisk demand by outside breeders, our ornamental plants find ready sale, and the fruit from our orchard, when it comes into bearing, will be readily disposed of to the school cafeteria and to outside customers. Field crops, such as alfalfa, sugar beets, and corn, are used for feed for our stock. The farm is of course run at a loss, and will continue to be so run as long as it must provide a laboratory for so many boys in proportion to its size. But educationally it yields large returns.

Our experiments in the proper use of the farm would not have been successful if we had had merely book farmers in charge. The man at present in charge of the dormitory and of field practice is a man of long experience in farming in southern California. He is not a college-trained man, and at the risk of rattling some educational bones, let it be known that we are glad he is not. The acting head of the agricultural department is a man who has had several years' experience *making his living* on a farm. He is a graduate of an agricultural college, and we are glad he is. So there ye are, as Mr. Dooley would say. The crux of the matter is, that we would have failed if we had tried to put in charge of practical farming operations, men who were not themselves practical farmers. We need men who have the practical farmer's point of view. And we need an occasional man who does not have the university point of view.

COURSE OF STUDY.

Our course of study in agriculture, as it will stand at the beginning of the next term, is as follows:

Ninth Year.

Plant Propagation and Botany.
Farm Building Construction.
English.
Algebra.
Chorus or Oral English.

Tenth Year.

Zoology. } Elementary Animal Husbandry.
Field Practice.
English.
Geometry.
Chorus or Oral English.

Eleventh Year.

Horticulture. } Agronomy.
Forge or Field Practice.
Physics.
American History.

Twelfth Year.

Principles of Breeding, ½ year. } Advanced Animal Husbandry, ½ year.
Rural Law, ½ year. } Farm Management, ½ year.
Chemistry.
Elective.

In the construction of the course, and in the development of plans for the proper utilization of the school farm, certain principles have been kept clearly in mind; principles that we regard as fundamental in agricultural education. This is not the place to discuss educational theory; a brief statement of four of the principles mentioned will be enough.

1. *A boy preparing for agriculture must devote several hours daily to productive manual work.* A school which serves country boys need not concern itself so much about providing the facilities for such work. But a school which serves city boys finds its duty clear.

2. *Practice and theory, like induction and deduction, must go on together.* They can never be far apart in a properly organized course. Our people are inclined to think that practice should precede theory, and in a high-school course in agriculture should rank above it.

3. *The science teaching of the school must be correlated with the applied courses.* All our teachers of agricultural subjects, including the sciences, are men who have had practical farming experience; and all except the teacher of field practice are graduates of agricultural colleges.

4. *Any high-school course, even a vocational course, should be a broad one.*

Our problem here is a fascinating one. We have not yet reached a solution that is final. We hope we never shall.



DESIGNED AND MADE BY STUDENTS IN THE MANUAL ARTS DEPARTMENT OF THE UNIVERSITY OF MISSOURI.

GLUING DEVICES FOR THE SCHOOL SHOP.

HARRY L. HURFF.

ONE frequently hears of difficulty in gluing up various kinds of work in the school shop. The trouble often lies in the lack of simple devices or "kinks" for doing the job on hand. The following pages give a few solutions of problems that have been found and used sucessfully.

PICTURE FRAMES.

Nearly every shop sooner or later needs to glue up picture frames. Sometimes this is discouraging work because the joints may break open

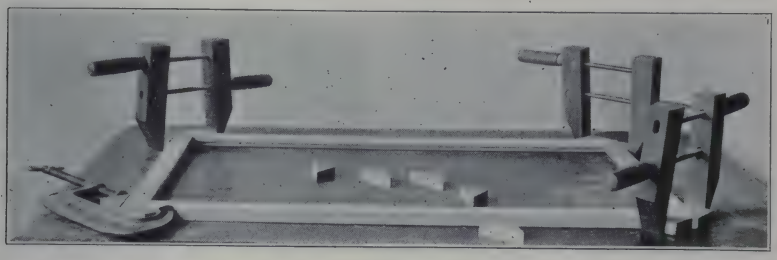


FIG. 1. GLUING PICTURE FRAME.

when the clamps are removed. It has been rather common practice to glue triangular blocks to the corners of the frame, after which clamps may be used to draw the pieces of the picture frame together. This takes unnecessary time and labor. If the joints have been properly prepared it takes but a very slight pressure to glue them. Cut triangular blocks as tho they were to be glued on, and drive two small brads into the side to be placed in contact with the frame. Cut off these brads so they project ⅛″ or $\frac{3}{16}$″ and sharpen to a point. When a frame is to be glued, the blocks are pressed to the corners of the frame until the brads penetrate their length, after which the glue is applied and the clamps put in place as shown in Fig. 1. The clamps may be tightened up considerably before the blocks will slip. After the glue has had a short time to set, the clamps and blocks may be removed and used on another frame.

DRAWING BOARDS.

Many shop teachers have been asked to make drawing boards for the school, and find it a long-drawn-out task if each board is glued with a pair of cabinet clamps. This method requires a great many clamps and considerable floor space. Fig. 2 shows a clamp devised to accommodate any number of drawing boards up to seventy, on the floor space re-

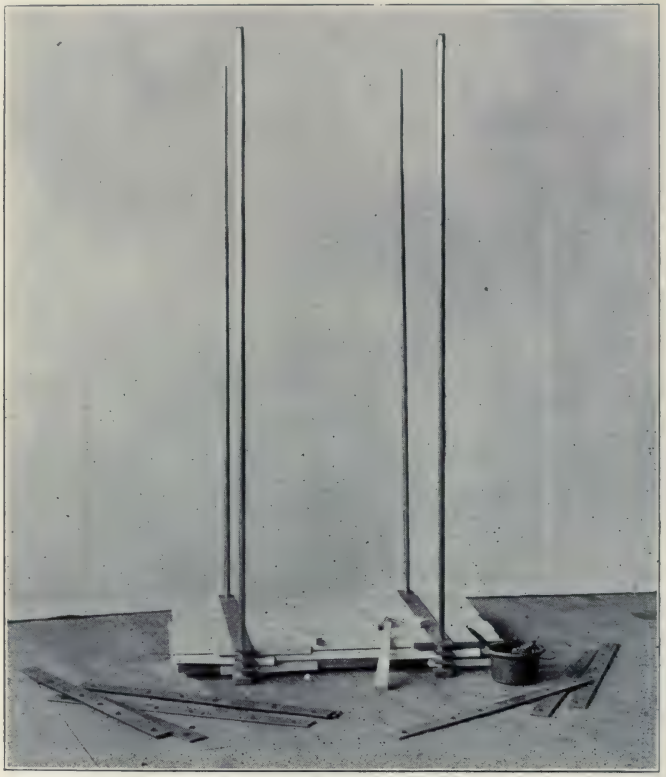


FIG. 2. DRAWING BOARD CLAMP.

quired for one board. The upright bars are made of ¾″ cold rolled shafting, threaded and screwed into the ½″x2″ iron strips at the bottom. All other cross-irons are ⅛″ thick, and made with a series of ¾″ holes to accommodate different widths of boards to be glued. Wedges made of stock the same thickness as the boards, and cut 12″ long with a ½″ taper, are driven in between the upright bars and the edges of the boards. This clamp works easily and very efficiently.

GLUING MITERED TABLE LEGS.

Practically every teacher has requests at some time from his students for a library table. This project frequently falls short of what it might be, one reason being the size and weight of the legs. Often the least

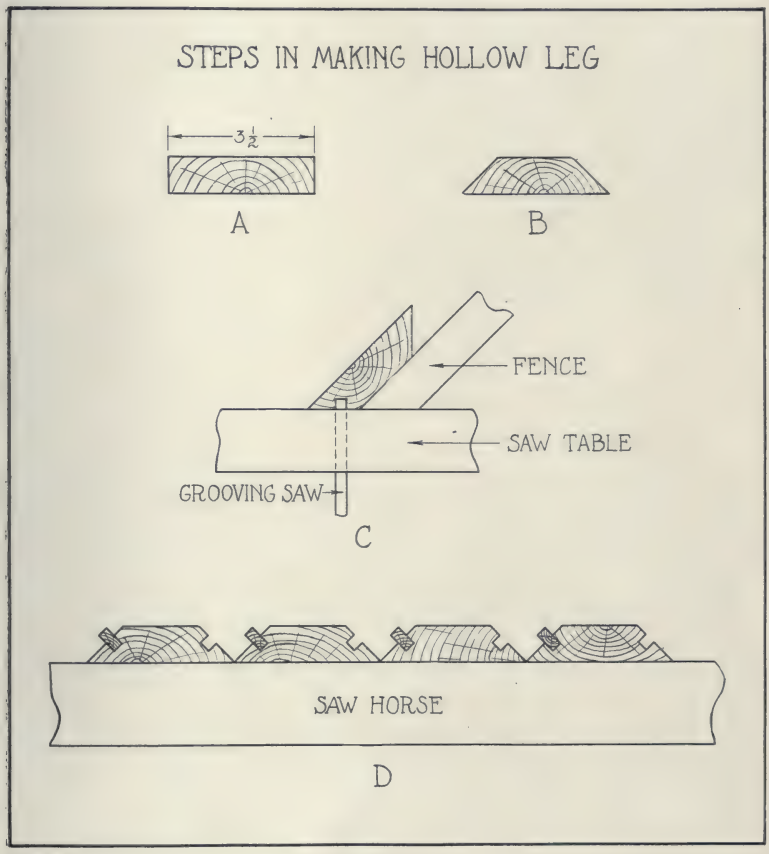


FIG. 3.

desirable method for making the legs is to glue up enough pieces of the proper width to make a solid leg. A hollow leg made of four pieces of stock mitered at the corners makes a lighter and better piece of furniture.

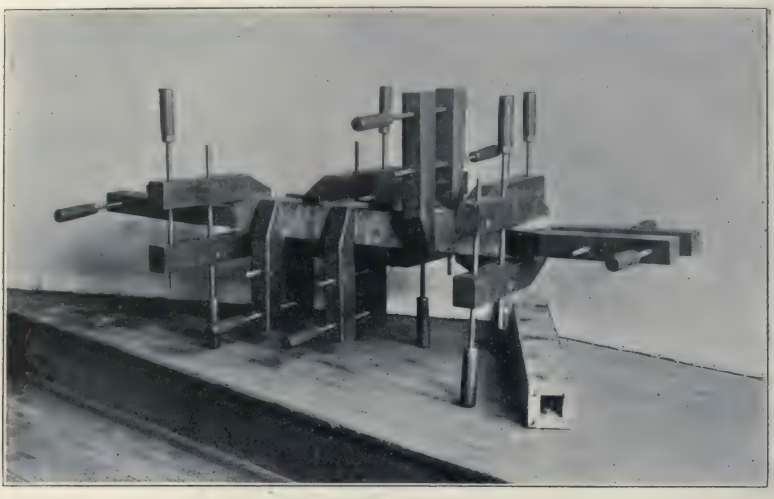


FIG. 4. A SLOW AND DIFFICULT METHOD.

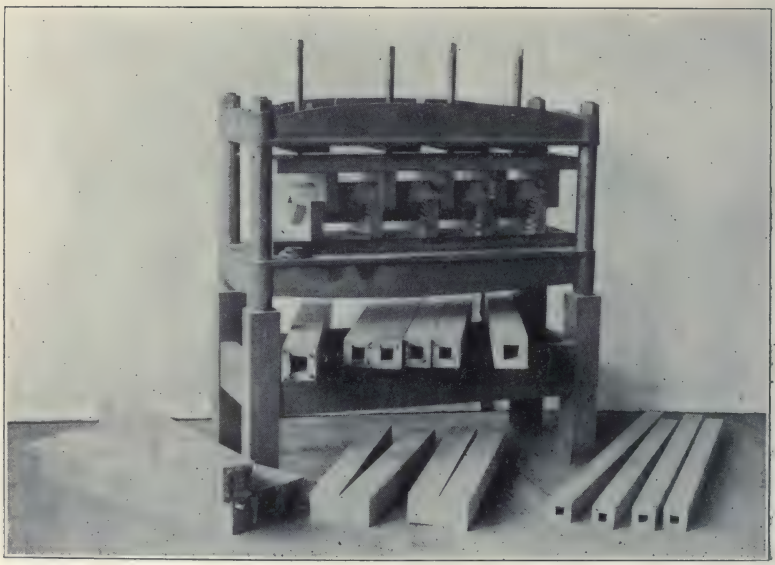


FIG. 5. GLUING DEVICE IN GLUE PRESS.

The pieces, four in number for each leg, are made of 1″ stock to the width of the finished leg, A in Fig. 3. They are then taken to the jointer to have the edges mitered, B, Fig. 3. Each corner is taken off in two cuts, the jointer fence being set at 45°. The saw fence is then set at the same angle, and the pieces run across the grooving saw cutting a ¼″ groove as shown at C, in Fig. 3. Finally, a sufficient number of strips, or tongues, which fit these grooves snugly, are prepared, and the job is ready to be glued up. This may be done by either of the following methods: (1) An experienced workman will be able to use the method shown in Fig. 4. However, there is a danger of the leg being

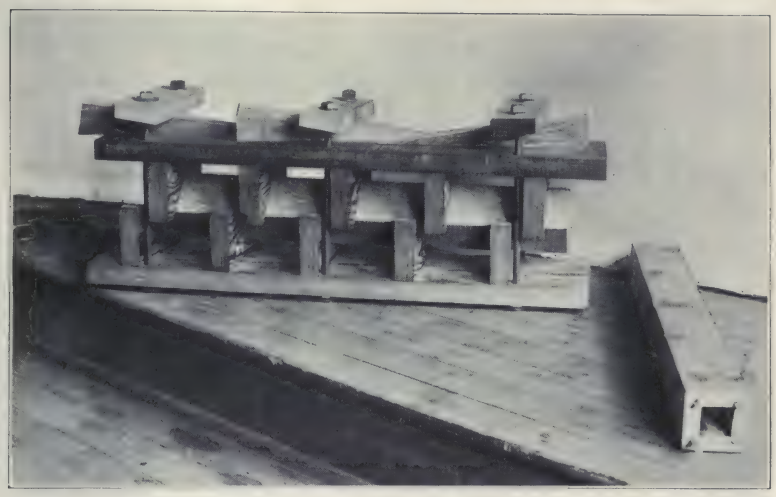


FIG. 6. A SUBSTITUTE FOR THE GLUE PRESS.

out of square. This can be avoided by practice and painstaking work. Another objection to this method is the number of hand clamps required. (2) In Figs. 5 and 6 are shown better methods of clamping. Two sets of blocks provided with a V cut on one side are screwed to a base. The pieces making the leg are placed in this clamp and pressure applied by a light tightening down of the clamps of the glue press, Fig. 5. In case the shop is not provided with a glue press, equally goods results may be obtained by the use of the wedges and bolts shown in Fig. 6. Either of these methods will give a perfectly square and well glued job. Fig. 5 shows a quantity of table legs in various stages of completion glued up by these methods.

As a rule school shops are not well equipped for handling glue.

Pieces of wood which are to be glued must be thoroly warmed before the glue is applied, and then must be placed in the clamp very rapidly. The best way to apply glue to the table leg pieces is to lay them side by side on a pair of trestles or saw horses as shown at D in Fig. 3. The tongues are inserted and glue is applied rapidly to mitered edges, after which the hands are placed beneath the pieces, rolling them up until all mitered surfaces are in contact. The leg is now placed in the clamp and pressure applied.

A quicker method of preparing the stock for the legs may be used if the shop is equipped with a shaper. The miter and a tongue and groove joint are cut in one operation, thus saving time and allowing fewer pieces in the making.

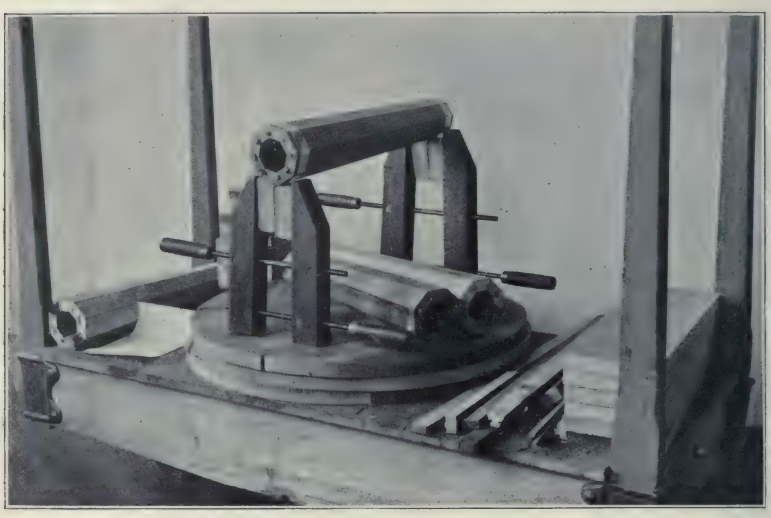


FIG. 7. USE OF STRAP CLAMP IN GLUING OCTOGONAL COLUMN.

GLUING A MANY-SIDED COLUMN.

A many-sided column, such as might be used for the pedestal of a table, may be glued up very easily by the use of a strap clamp shown in Fig 7. A piece of strap iron is cut to the proper length for the column to be glued, and a piece of wood is fastened to each end. The strap is then placed around the column and drawn tight by means of an ordinary hand clamp. One of these straps should be placed every ten or twelve inches to do a first-class job. Fig. 7 shows parts of several small tables in various stages of completion, one of the pedestals being held by the clamps just described.

PRESENTATION OF THE WORKING DRAWING TO THE GRAMMAR GRADE PUPILS.

A. R. SPILLMAN.

ONLY last week I heard a man of no mean ability say that it was almost impossible to get a drawing from a grade pupil which was correct in every respect, until the pupil had actually constructed the object. It seems to me that this would not be the condition if the work were given to the pupil with the idea of clinching fundamentals. We have been demanding too much at the outset: trying to teach the fundamentals of this work, and at the sime time making a drawing of a model to be constructed. This is too much for the average pupil, and

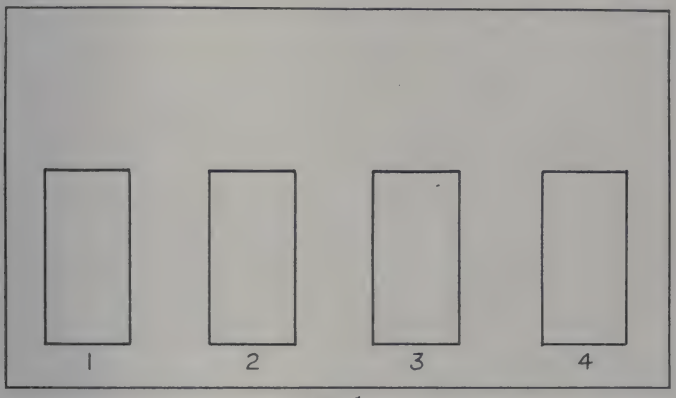


FIG. 1.

more time and thought must be given to this work to obtain satisfactory results. The pupil must know the meaning of every line, as well as put it on the paper at the teacher's suggestion. It takes more time than is usually allowed to lead the mind away from the perspective.

We have found the following method very effective in our schools, and thru it the pupils have been able to grasp the principles very quickly.

Prepare four blocks of wood, each 1½″ long and ¾″ wide, but of different cross-sections: one square, one triangular, and two circular. Bore a ¼″ hole in the center of each cylinder, going clear thru one, and half way thru the other. The development of the working drawing from these is much easier than from a more complex finished model, and is more effective in getting the idea to the pupil.

Develop the four elevations first, starting with the rectangular block. It can be held before the pupils's eye in such a way that he can see nothing but the elevation (which is difficult to do with a larger piece), and he will be able to draw this view, a rectangle ¾" by 1½", Fig. 1. Next take up the triangular block. The pupil will see that its elevation is the same as that of the rectangular block, 2, Fig. 1. The elevations of the two cylinders are the same as those of the other two blocks, 3and 4, Fig. 1.

The pupil will see that the elevations of all four blocks are exactly the same; and to show that they are different, another view is necessary,

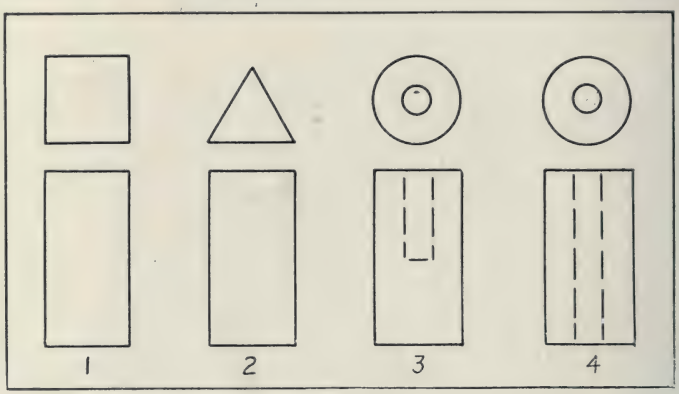


FIG. 2.

namely, the top view. Develop the top views and place them in their proper positions, Fig. 2.

When the drawings are placed on the board in a position similar to Fig. 2, the pupil will see that it is the top views which tell us that the blocks are entirely different, and that at least two views are necessary for every working drawing. He sees that the top views of the cylinders are the same, and that the elevations are the same, but he knows that the blocks are different. Here is where the hidden outline can be explained; the pupil will see the need of it. Put in the hidden outline as in 3 and 4, Fig. 2.

When the pupil has developed this work which should not take more than thirty minutes, he has a good foundation, for the drawing of his models. Individual instruction will be cut down to a great extent and a better working drawing of the model will result. To some this may seem to be unnecessary work, but we have found it to be a time-saver and a great help to the pupil in his later drawings.

THE SPRINGFIELD MEETING OF THE EASTERN ARTS ASSOCIATION.

HARRIS W. MOORE.

AFTER a vigorous campaign of advertising, the seventh annual convention of the Eastern Arts Association held in Springfield, Mass., April 20, 21, 22, proved to be the largest and most successful convention in the Association's history. This advertising consisted of a preliminary notice and program from its able president, Millard B. King; an invitation from the Springfield Board of Trade, and a reminder and invitation by each of many commercial houses interested in school supplies and equipment. The cumulative effect of these became almost irresistible, and brought the attendance to 1,300.

Springfield offered her gracious hospitality most liberally. Among the concrete expressions of this hospitality were the services rendered by students, teachers and school officials, and by the convention bureau of the Board of Trade; the use of school halls and classrooms for various meetings; and the opening of the magnificent municipal auditorium for receptions, round table meetings, a fine organ recital, and for the extensive exhibits.

A fine spirit of good-fellowship manifested itself in many reunions and social gatherings of various school, city, and state organizations, and in the large banquet Thursday evening at Hotel Kimball, the headquarters of the convention.

The banquet room of the hotel was crowded with small tables around which feasted strangers and friends, all alike manifesting a purpose to enjoy themselves and spread the good-fellowship. The genial toastmaster was Stewart Anderson, of Springfield; the first speaker was Henry Turner Bailey, who with charactertistic charm of illuminating anecdote and illustration showed how teachers could and should collect, mount, and cross-index in a vertical filing cabinet all manner of material germane to the subject taught; the second speaker was Commissioner David Snedden, who ventured the assertion that the next few years would be trying ones in educational expansion, and it would become us to define our aims and terminology more completely and accurately; and the last speaker was Prof. Alfred V. Churchill, who by exposition and lantern slides showed that such modern movements in art as the cubist were serious attempts by men of strong parts to produce a

pure and absolute art independent of all imitation of nature. By arrangement of line, mass, and color they aim to produce a distinct mood. The canvas should be marked "Opus" like that of a composer.

Under the broad purpose of this Association, the program called for consideration of art, drawing, manual training, industrial, technical, vocational and prevocational training, household arts and special classes. There were over forty papers presented during the two and one-half days' meetings, and many discussions of these papers.

THE ARTS HIGH SCHOOL.

Thursday was a day full of addresses and discussions. After the opening addresses of welcome at the general session, Miss Irene Weir and Dr. William E. Bohn gave a clear exposition of the purposes and methods underlying the work of the Arts High School department of the Ethical Culture School, New York City. The deepest purpose of the Arts High School is to discover the life interest of the pupil, and from that interest to develop the personality and special interests of each pupil. Weekly visits are made to the Metropolitan Museum for the purpose of sketching, studying, or copying the best historical examples of art. These serve to inspire original designs of tiles, vases, costumes, posters or whatever things are needed in the school. Dr. Bohn showed how the study of literature is vitalized by the art course which closely correlates with it. Its aim is to give a real insight into the minds and hearts of older peoples. For American children, this should culminate in a broader understanding, and eventually some concrete expression, of the big things of the great, modern, eager, throbbing, aspiring, American life.

Tho the topic assigned to Vesper L. George of the Massachusetts Normal Art School was "Problems in Interior Decoration," he stated that it was his purpose to give only a point of view from which decoration could be considered. That point of view was from the angle of good design. Antiquity, historical label, expense, rare material—these are no guarantee of good design, of beauty of line, proportion, or color.

PREPAREDNESS—INDUSTRIAL EFFICIENCY.

The last speaker, Alvin E. Dodd, brought a thrill from the tension created in Washington on the previous afternoon when President Wilson

addressed the joint session of Congress on the matter of our contention as regards submarine warfare. Mr. Dodd's address was largely an exposition of the provisions and the resulting benefits of the Smith-Hughes bill soon, he hopes, to come to a vote in Congress. He showed that the problem of preparedness in this country is very largely a problem of industrial efficiency. That this truth is realized by Congress is shown by the passage of a rider to the army bill to the effect that trade instruction shall be given to soldiers in training for the purpose of enabling them upon their discharge to enter effectively into industrial life. Federal aid would take the form of grants to states to advance agricultural and trade instruction in all-day schools, part-time schools, and evening schools. Appropriations would also be available for making investigations which would be helpful to all vocational schools.

THE TIME FACTOR IN MANUAL TRAINING.

Thursday afternoon was occupied with three round tables, each with two or three papers. The most important feature of these round tables was the report on "The Time Factor in Manual Training for Elementary and High Schools," given by William R. Ward, of Trenton, chairman of the committee which has been studying this problem for two years. A digest of this report is to be prepared and given wide publicity at an early date, with the purpose of bringing its findings to the attention of those vested with authority to establish courses of study. It has been found that the time devoted to manual training in the upper grades averages about one and one-half hours per week. About 15 per cent of school time is devoted to arithmetic, and only 4 per cent to manual training. Mr. Ward referred to the strong position taken by the *Manual Training Magazine* when it stated that "not until manual training has a time allowance on the school program equal to that of the most favored subject can it prove its true value, and not until then should comparisons of results be made critically." With its 52 hours a year manual training shows meager opportunity for the cultivation of skill in comparison with an apprentice system with more than 1,000 hours a year. As a remedy for this short time allowance three plans were suggested: (1) a reduction of time now given to some of the more formal and unessential studies; (2) a closer correlation of manual training with other studies; and (3) a longer school day, as is common in some European countries. Manual training, broadened, enriched, closely correlated, lengthened in time, offers a good substitute for the

general farm opportunities which have proved invaluable to former generations.

CLASS TEACHING IN A MUSEUM.

Again on Friday morning there were four papers presented to the general session of the convention. Mrs. Agnes L. Vaughn gave an interesting account of the work which the Metropolitan Museum of New York City is doing in bringing the resources of the Museum to the attention and use of the schools. The Museum now has classrooms to which objects may be brought from the galleries for sketching and study by classes from public or art schools. Such opportunities offer the inspiration of masterpieces, and this is a distinct aid to the pupil's own originality. Not only people interested in art are coming in touch with the Museum, but also teachers and students of history and literature are getting help in their effort better to reconstruct the life of former centuries.

The paper prepared by Dr. Bonser of Teachers College, New York, was, in his absence, read by his assistant, Mr. Constantine. Two of the ends of industrial education in elementary schools should be the making of better savers and better spenders. In the junior high school the study of (1) materials, (2) processes, and (3) uses should be continued in larger projects and with greater diversity of materials and tools. In the vocational school a broad education should be given to pupils who plan to go to a technical school, but a specialized education to those who plan to enter a trade. In this country we have emphasized individualism; now we must add the element of collectivism.

With the use of the stereoptican, Miss S. B. Tannahill of Teachers College, illustrated some of the principles which form the basis of good lettering and showed the lines of work she is carrying on there. Arthur S. Allen of New York, showed how wide is the gap in the graphic arts between the art student and the real world of business requirements. Good positions are open by the score to those who have original ideas and the power to work them out within the conditions imposed by materials, processes, and the requirements of business.

At a conference and luncheon at Hotel Kimball where "Problems of Art Education in Public Schools" was the topic of discussion, Dr. Snedden emphasized strongly the point that whereas art education cannot develop in many a creative art ability, it can and should develop in all a large and important appreciation of art because all are consumers.

Excursions were made by those interested to a number of factories and other attractions centered in and about Springfield.

After an early organ recital, Friday evening was set apart for viewing the exhibit. Springfield utilized the whole of the basement of the auditorium building for her splendid display, and evidently her citizens were bent on seeing them all. One marked feature of the exhibits was that few, if any, formal models or exercises were shown. Most of the work was of a nature to appeal to the interests of boys and girls.

Again on Saturday morning four papers were presented to the general meeting of the convention. In an address on "The Artist Craftsman," Dr. Arthur Fairbanks, of the Museum of Fine Arts, Boston, spoke of the relatively great influence of the arts and crafts movement; but he contended that this movement, because of its limited output and its aloofness of spirit, could not bring us far forward. An artist is the man who puts himself into his work, whatever that work may be. He will not discard tools, but strive to master them, whether they be simple as a knife or complex as a modern loom. That the products of machines need not be of poor design and quality, he proved by reference to the fine lace factories of Switzerland. We must not blame the machine, but rather insist upon good design and workmanship. We must build our faith in the possibility of artistic work even in an age of machinery.

A NEW SCHOOL FOR GIRLS ENGAGED TO MARRY.

The address of Miss Arnold, dean of Simmons College, revealed a deep human sympathy, a broad-minded common-sense, and a passionate love for the beauty of life. Her comment on preparedness was that it must be of just proportion and balance to be of value; bread may feed the body, but beauty feeds the soul. Our country depends for its perpetuity upon good public schools, and these may be tested by the lives of our people. Our schools must teach the mothers of the land that they in turn may enrich its homes, for the teaching of the home is enduring. One new school should be founded and that should be a school for girls engaged to marry. At such a time of intensive interest, learning would be swift and easy. Schools should recognize what is taught at home and excuse girls from topics learned at home.

The report of the committee on standards was made to a crowded meeting. This was a report of progress illustrated by charts selected and graded for marks in the elementary grades. The committee asked to be allowed to continue their work with the addition of three members.

The committee on terminology made a report of progress at one of the general sessions and asked to be continued in office for further study and conference with like committees of the National Education Association and the National Society for the Promotion of Industrial Education.

The following officers were elected for the ensuing year:

President, Royal B. Farnum, Albany, N. Y. Vice-president, Egbert E. MacNary, Springfield, Mass. Treasurer, Morris Greenberg, Brooklyn, N. Y. Secretary, Fred P. Reagle, Montclair, N. J. Members of Council for two years, H. K. Kniffin, Pittsburg, Pa., and Miss Isabelle Lord, Brooklyn, N. Y.

> YOU CAN TEACH A MAN TO DRAW A STRAIGHT LINE, AND TO CUT ONE; TO STRIKE A CURVED LINE, AND TO CARVE IT; AND TO COPY AND CARVE ANY NUMBER OF GIVEN LINES OR FORMS, WITH ADMIRABLE SPEED AND PERFECT PRECISION; AND YOU WILL FIND HIS WORK PERFECT OF ITS KIND; BUT YOU ASK HIM TO THINK ABOUT ANY OF THOSE FORMS, TO CONSIDER IF HE CANNOT FIND ANY BETTER IN HIS OWN HEAD, HE STOPS: HIS EXECUTION BECOMES HESITATING; HE THINKS, AND TEN TO ONE HE THINKS WRONG: TEN TO ONE HE MAKES A MISTAKE IN THE FIRST TOUCH HE GIVES TO HIS WORK AS A THINKING BEING. BUT YOU HAVE MADE A MAN OF HIM FOR ALL THAT. HE WAS ONLY A MACHINE BEFORE, AN ANIMATED TOOL.—John Ruskin.

EDITORIAL COMMENT

AT the Grand Rapids meeting the head designer at the Berkey and Gay Furniture Company, Lachlan McLachlan, made a statement which should give courage to high-school teachers of the manual arts. He said that since he had been with that Company he had tried out twenty-one young men in his department. Three were graduates of a famous school of industrial art in the East, one a graduate of an art school in New York City. Several were graduates of a Western art school, several came from the shops of the furniture industry and seven came from high schools in Grand Rapids. After relating his experiences more or less in detail, with all of these, he said "The best men I have found are the high-school graduates who have had drawing and manual training."

AT the Grand Rapids meeting the report of the Council contained a recommendation that the Associaion change its too long and too narrow name to the more compact and broader term "Western Arts Association." The fundamental reason given was not to conform to the change that took place last year at the Eastern association, thru that was mentioned as an incidental one, but it was to secure a name that shall reasonably well express the scope and ideals of the organization as it is today. It was pointed out that the original name, Western Drawing Association, would not now be satisfactory to the original members of the Association. They consider that they now have a higher ideal than they had twenty-three years ago. They used to teach drawing; now they teach art. After ten years the term "Manual Training" came into the name to express the combined ideal when the shopwork teachers joined the organization, but this unwieldy term has never been satisfactory. And now that the Association meetings include household arts and vocational round tables and are likely to include a printing round table in the near future, the long name is certainly too narrow.

Last year when the Eastern association adopted the term "Arts" we thought it was a mistake, but more study of possible names and their significance has convinced us otherwise. We now believe that there is no other term which will so generally and so adequately meet the situation. The term "Art" unmodified and without the "s" would not suit a large proportion of the membership of the society. The terms "practical arts"

and "industrial arts" would hardly score a larger vote than "art," while the term "manual arts," tho generally used as including the drawing and painting, as well as work in construction, is not yet so interpreted by everyone, and even if it were, would find objectors among some of the champions of the fine arts ideal, on the one hand, and some of the definition experts on the other. But when all adjective modifiers are dropped we have the common term "arts" upon which it would seem that all could write, with the possible exception of a few of those who would wish to emphasize the science side of vocational education, which seems to them to be far removed from art.

When one stops to consider to what an extent the word "arts" is coming into our educational terminology he begins to appreciate the appropriateness of the term selected by the Council. For instance we say fine arts, school arts, manual arts, graphic arts, printing arts, book-making arts, textile arts, household arts, home-making arts, domestic arts, industrial arts, mechanic arts, plastic arts, practical arts, and applied arts. The common denominator of all of these is found in the unmodified term "Arts." It would seem that by the least possible compression of our ideas lengthwise the name "Western Arts Association" would include us all; and breadthwise it would leave plenty of space to grow into, and we may need it in the next twenty-five years. There may be other arts yet to come into our field.

ON TRIAL.

SOME phrases slip off of the tongue so readily with a half truth and sound so well when spoken that they easily become current in our educational writings. One hears them at every convention and reads them often in the news of the day. Such a phrase is this: "Manual training is on trial; most manual training men are on the defensive." Judging from its use, this statement would seem to have originated with some one who would discredit manual training in order to build up a particular type of vocational education. Now it would seem to us that it would be just about as easy to say, and fully as easy to prove, that vocational training is on trial, and that vocational training men are likely to be on the defensive very soon. We do not object to the quoted statement by itself, but it is the intended inference that is damaging. Moreover, we think that such a statement is either the result of too superficial a view of the big problem of democratic education or too

limited a knowledge of the vital elements of manual training. If it is not these, it seems like a quibble of words.

We should not forget that there are some compensations for being on trial. In the first place a subject is not on trial until it is in the school. To say it is on trial is to say it is there, and therefore the first great victory is won for the subject. In the second place, if it is on trial it is being given a chance to prove itself, and there is some value in that. If it cannot make good, the trial ought to terminate by dropping it out of the school. In the third place, it is in distinguished company, for Latin is on trial, Greek is on trial; our revered disciplinarian, mathematics, has been summoned for trial, and even our near neighbor, physics, is hoping that the officer of the court will not find him out. Why not be inclusive in our statements about subjects being on trial? Why not be generous and say that education is on trial, not only in America, but in every country where it has become a potent factor in the lives of the common people. Why not accept the *honor* of being on trial—of being summoned to trial in the court of humanity. What more could any subject ask than that it be given a fair trial in its efforts to serve in the uplift movement of the world.

As said before, we do not object to the idea of manual training being on the defensive as long as it has good company, it will do it good, but we do not like to have any one imply that to build up vocational education one must tear down manual training, just as though it encumbered the ground. In our estimation it is the wrong approach to the solution of the big problem. The right approach, and we think we have seen ample proof of this during the past two years, is *thru* manual training, not in opposition to it. The most effective way is to regard the manual training as a part of the foundation upon which can be reared a more sightly and attractive superstructure to be known as vocational training. And then, to continue the figure, who can tell where the foundation ends and where the superstructure begins? Why not make it a monolith, and think of it all as one structure? Why not think of it all as one pavilion of the great social structure, education for life in the twentieth-century —an education that recognizes individual differences, capacities, and economic necessities; that sees no worthy difference between training a girl for salesmanship and for teaching in a high school, or a boy for serving the community as a plumber or as a preacher? Isn't this what the true advocates of both manual training and vocational training are working for?

We hope that the next school year will see another long step toward the realization of this democratic ideal. And it seems to us that the length of the step will depend, in part, upon dropping unreal and merely superficial differences. Then we can spend all our energy in working out the real vital elements of the problem. We are all on trial.

—C. A. B.

WE have had occasion to refer from time to time in the pages of this Magazine to the increasing number of school papers edited, managed and printed by pupils in the schools.[1] Such references have been prepared primarily as items of news, with the object of keeping our readers informed as to current developments in an interesting and profitable field of activity.

It seems appropriate at this time, however, when most schools are rounding out another year's work, and those responsible for their direction are considering plans for the new year, to comment on the school paper from another point of view. A new note is being struck in this particular phase of school work that has not been adequately treated in any of the discussions that have come to our attention.

In tracing the evolution of the school paper printed in the school, it is perhaps fair to say that the chief object in view originally was to furnish a practical outlet for the activities and the skills developed in the school print shop. Almost from the beginning, also, there was appreciation of the possibilities in the direction of contributing to the training in language, not only of the students who personally participate in the production of the paper but of the entire student body.

It soon becomes apparent that there is a further service that can be rendered by the school paper, in the fostering of school spirit and in promoting that solidarity of interest and purpose that distinguishes the real school from a place of confinement.

There are doubtless other motives, and other stages in this evolution, that would be disclosed by a careful analysis. The feature that seems to us to be the latest development, which we have referred to as a new note, is the suggestion of the possibility of using the school paper to establish a vital connection between the school and certain aspects of civic and social activity in the community outside of the school. This possibility, and the prospect of its early realization, have been suggested by the publication of the first number of "The Health Messenger," which

[1]See especially the April, 1916, number, p. 641.

issued in February, 1916, from the press of the Albany, N. Y., School of Printing. This is a companion organ to "The Vocational Messenger," now in its second year, which is published by the same school in the interests of the Albany Vocational Schools.

The new journal, which is projected as a monthly, proposes to cooperate directly with the state and municipal departments of Public Health, and organizations of citizens and parents, in the promotion of the physical welfare of school children, and thus, indirectly, in improving health conditions in the community. Promises of cooperation have been secured from the Departments mentioned, and from individual physicians, dentists, nurses, and others in position to offer vital and authoritative contributions to such an undertaking.

It is proposed to prepare and publish material dealing in a very practical way with topics that may properly be treated under the general subject of educational hygiene. Included in a list of suggested topics may be noted the following, to indicate something of the objects in view: school lunches, exercise, dust and dirt, keeping well, first aid treatment, posture, fatigue, prevention versus cure. It is intended to present this material in such form that it may be utilized readily by principals and teachers as a basis for the teaching of practical hygiene, having in mind the needs of pupils of all ages.

The field of effort will not be limited to the school and the child, but will include, as far as possible, the street, the home, the place of amusement, the place of employment, and the community as a whole.

> We seek to make real to everyone that *health* must be the *first* consideration in education, and that it pays in dollars and cents to look after the *physical child first,* so that he may be in fit condition to profit by the free school training furnished by the city.

The Albany Vocational Schools are to be congratulated on the enterprise and vision manifested in this new undertaking, and, in our judgement, the example thus set may be heartily commended to other schools having the facilities which would make its emulation possible.

—W. T. B.

OF CURRENT INTEREST

THE GRAND RAPIDS MEETING.

Out where the handclasp's a little stronger,
Out where the smile dwells a little longer,
That's where Michigan begins.
Out where the sun is a little brighter,
Where the snows that fall are a trifle whiter,
Where the bonds of home are a wee bit tighter,
That's where Michigan begins.

Out where the world is in the making,
Where fewer hearts in despair are aching,
That's where Michigan begins.
Where there's more of singing and less of sighing,
Where there's more of giving and less of buying,
And a man makes friends without half trying—
That's where Michigan begins.

THESE stanzas read by Miss Emelia Goldsworthy in responding to a toast at the banquet on the opening evening seem to express the spirit of the twenty-third annual meeting of the Western Drawing and Manual Training Association held in Grand Rapids, May 3rd to 6th, 1916. While it was found true that many of the old friends were not there—a surprisingly large number, in fact—it was also true that the attendance was very large. This was easily accounted for in the fact that the local state membership at this meeting was larger than usual —"that's where Michigan begins."

Of all the sessions of the convention it is possible that the banquet will be remembered longest because of its novel character, the good taste displayed in its varied features and the good stories that were told and enjoyed. As each person entered the banquet hall he was given a cap made of tissue paper and was told to wear it. Some were in the shape of flowers, others were turbans, and bonnets with strings, and still others were mere fanciful devices for head decoration,—and all were in colors, thus giving a gay appearance to the room. The genial toastmaster, H. E. Wood, of Indianapolis, and whoever else may have been responsible for the surprises and delights of the evening, deserve commendation.

With a program of addresses designed to serve the variety of interests represented in the organization, it would be futile to attempt to pick

out any one or two addresses as being of greatest significance, yet it would seem to be only fair to say that there were three speakers whose addresses seemed to receive the most comment. These were Dr. James P. Haney, of New York City, representing the art interests, Dr. C. A. Prosser and Miss Elizabeth M. Fish, of Minneapolis, speaking on vocational education.

Dr. Haney's address on the "Art of Teaching Art," was calculated to show how it is possible to teach art appreciation to large groups of children—even 500 or 600 at a time. He recommended such teaching in connection with museums of art, and illustrated his methods with a class of Grand Rapids children. One of the essentials of his method was in the utilization of the dramatic representation of an idea, in which art Dr. Haney is himself a master.

Miss Fish, in an address that held attention and was thoroly enjoyed, gave an inspiring picture of the girls vocational school problem. It was significant that she began with the girl—her nature and her needs —instead of beginning with the industries and their needs. She did not, however, ignore the industries either in their needs or their nature. She would make her starting point the nature of the girl; she would accept that as it is; and one could easily infer from what she said that if the conditions in the industry were in conflict with the nature of the girl, she would be willing to undertake the task of helping to change such conditions.

WHAT A VOCATIONAL SCHOOL CAN DO FOR GIRLS.

She began her address by stating that a fundamental factor in the problem is found when one realizes that the adolescent girl desires to adorn herself, and that she has at this time an intense sense of responsibility. It is just at this time when a girl "wakes up" that she is ready to get an education. After speaking further of the nature of the girl, Miss Fish summarized what a vocational school can do for such girls as follows:

(1) It can get her safely over the "sifting and sorting" stage, and land her safely in a good position. To do this, however, it is essential that the school offer a variety of courses on exactly the same plane. Each must be regarded as just as honorable as the other, so that a girl will not lose caste or feel demoted in changing her course to fit her capacities and special needs.

(2) It can give enough technical education to help her over the period of inexperienced helper to that of skilled worker.

(3) It can be behind her to help her after she has gone out into industrial life.

Miss Fish insisted that the teachers in such a school must be the *pick of the trade workers* and that the school must keep in touch with the industry.

She does not insist on teaching home-making to every girl at this period because she believes that "when the girl gets over her nebulous idea of a home she will come back to get what she needs" and that then she will learn the arts of home-making most speedily, for it will be done with a maximum of interest.

DR. PROSSER'S ADDRESSES.

Dr. Prosser gave two addresses both of which have in part, at least, grown out of his experiences in connection with the Minneapolis Survey. In the first he emphasized the importance of "Art Training for Industry," but while doing that he laid almost equal emphasis upon art training for culture. "Art for production's sake should be coupled with art for consumption's sake." He spoke of the latter as the problem for the twentieth century in general education, while the former is the problem in vocational education. Both are needed. In his second address Dr. Prosser showed the importance of training what he has very aptly (especially for these war times) called the non-commissioned officers of industry. He told of conditions of advancement in the milling industry of Minneapolis. The facts were not at all startling nor essentially new, but they served him well in giving emphasis to the following three ways of advancing to the position of non-commissioned officer:

(1) Long and faithful service.

(2) Faithful service plus study somewhere, perhaps in a correspondence school. (In twenty years the men of Minnesota have paid more than $2,000,000 for correspondence school instruction).

(3) Training before starting in the industry. This training is such as may be given in a secondary technical school.

Dr. Prosser's contention was that the public high schools should provide training for both the second and third methods of advancement.

Invitations were received to hold the convention next year in St. Paul, Toledo, Dayton and Lincoln, Neb. After a lively contest on the floor of the convention the decision was reached to go to Lincoln. This was largely due to the able but modest presentation made by Miss Martha Pierce, supervisor of art in Lincoln, seconded by Professor

Crawshaw, who will be the chairman of the Council for the coming year. It was very generally felt that the Association is now in such excellent financial condition, after three successful meetings near the center of the territory, that it can well afford to go toward the western border of its field where it is claimed that such a meeting is much needed and where teachers from the other parts of the territory will doutbless get a new inspiration.

The election of officers resulted in a very pleasant compliment to S. J. Vaughn, the retiring president, who has carried a heavy load of work in connection with this year's convention, by electing him a member of the Council. The other officers elected were Professor E. J. Lake, of the University of Illinois, president; L. R. Abbott, of Grand Rapids, vice-president; Professor William H. Henderson, of Milwaukee, secretary; and Leonard W. Wahlstrom, of Chicago, treasurer; and Harry E. Wood, of Indianapolis, auditor.

INDUSTRIAL ART SHOULD BE DEVELOPED IN THE UNITED STATES.

At a meeting of the Chicago Association of Commerce held at the Hotel LaSalle on Wednesday, February 16, Dr. James P. Haney, art director of the high schools of New York, spoke on the subject "Industrial Art at Home and Abroad." Dr. Haney's chief contention was that the nation should develop and foster industrial art because the nation needs industrial art. The United States will be compelled, after the war, to dispute the trade of the world with the nations of Europe. These nations so thoroly believe in discovering and developing the talents possessed by their embryo citizens that they are willing to employ highly paid professors to instruct very small classes.

In one of these I ran across an industrial art school that was directed by a personal friend. He took me through the various classes, some with twenty students, some with fifteen students, and fianlly we came to an advanced architectural class that had a well paid professor, teaching day and evening, who had a studio of his own next to the big studio of the school, and who was pursuing his own profession at the same time that he gave criticism in the school, because they want these men to be actively engaged in business at the same time that they give their criticism; and I saw a class of three.

As my language was not any too certain, I carefully shaped up a sentence to ask the director of the school, and I said to him in rather broken tongue: "Now, doctor, although this class is small, I nevertheless assume that you consider the course a success." He understood well enough what was in my mind, and he turned around and looked me in the eye and said: "Mr. Haney, the men who can do this advanced type of architectural design are very few. If we only

had one man we should keep this course going, for who knows what that man might be able to do for the architecture of this country." (Applause).

You get some idea from that answer as to what the notion of the government over there is in regard to the specific training of the talented worker, to the point where he can do work of the greatest efficiency, not so much for the worker's sake, but particularly for the sake of the state in which he finds himself, the country which is to profit by his work."

The old world countries see to it that poverty does not veil genius.

You may believe it or not, but it is a fact that the sifting process is carried on to such an extent that a poor boy who cannot pay the fees has them cut in half. If he cannot pay them then they are withdrawn. If he cannot afford to attend even then, and he is a good worker, the school pays him to come. (Applause). You understand why the school pays him to come. They don't regard his training as a personal thing with him. They regard it as to the interest of the state to see that anybody who has a peculiar talent, whether it is in design for silk or design for metal or design for gold, have that talent perfected to the point where he can be used as an agent by the state to bring trade to the state. It is an economic question, as they regard it, pure and simple.

Dr. Haney went on to say that for a long time, during the evolution of education, reading and writing were the main subjects taught because then the mere ability to read and write was an immense asset, possessed only by a favored few. Later, as the counting house developed, great stress was laid on arithmetic. At the present time, manufacturing interests are dominant in the world, and we have, in this country, the pressure from the factory urging us to train boys and girls who are to be drawn into industry. In Europe, this demand of the factory has long been heeded. "We are behind in the training of artist artisans to an extent which is going to cost this country enormous sums of money in the years to come."

Dr. Haney says that he had great difficulty in translating the sentence, "There are many still in America who think art education is a frill," into German and French because the Germans and the French have not the background of ideas to enable them to comprehend such a sentence. They accused Dr. Haney of "making fun" when he said there were no great industrial schools in New York. The English proved equally unable to understand Dr. Haney's speech to this effect. And French, English and Germans are our enemies in that economic competition, which, in the end, will fix the map of the world.

Dr. Haney states, also, that this lagging behind Europe in the matter of industrial education is about to involve us in difficulties, here and now, at home.

I had occasion the other day to go to see one of our great furniture manufacturers in New York, and he took me around through his workshop. He said this to me, "Doctor, I am terribly concerned." I said, "Why?" He said, "You see these old men here?" "Yes." He said, "Some of these men will no longer be valuable to us in a few short years. I do not know where we are going to get men to replace them." "Why," I said, "what is the trouble?" He said, "Each of these men has been trained in an industrial art school. They are all expert workmen who have had years of practice as well as years of training. We try in vain to get from our own boys who come here that knowledge and experience. We can send them to no school in this city. We have not the opportunity to train them in our work, and what we are going to do to replace these men, I do not know."

Now, gentlemen, that is a fair picture of what I have seen more than once in factories in our own country. Realize what has happened. Consciously or unconsciously, for many years, we have been using the product of the industrial art schools abroad in our own manufacturies. We have used men who have been state trained. But now there flares on the other side of the water a conflagration which not only has burned up some of the best blood in the schools of the warring nations, but has shut these schools, and will leave the nations hard put to it to manage their own affairs, let alone endeavoring to supply us with aid along this line.

We are surely backward if we fail to realize how important this question is going to become to us in a relatively short time. You want to remember that this economic condition is really an economic war. The war itself on the other side has an economic foundation as to who shall have a place in the sun, who shall have a chance at the channels of trade, and how those shall be organized. And in the long run the economic war is one that keeps on, and is always fought by the man behind the pencil rather than by the man behind the gun. And the question is not only the training of an army of defense in this country, but it is the training of an army of offense which can carry the goods of this country, better designed, more beautiful in form and shape and color, to the markets of the world, so that those markets will purchase of us by virtue of the attractiveness of our product."

In conclusion Dr. Haney paints an imagined picture of the army of Chicago school children. He says that this army of 350,000 marching by at the rate of 1,000 in ten minutes would take nearly two days and a half to pass a given point.

Now in those serried ranks of marchers are children with all kinds of latent talent. Some are to be good musicians. Some are to be skillful in the art of writing. Some are to be clever literateurs, some clever in language. But there are a precious one hundred, two hundred, three hundred, who have wrapped up in their fingers this wonderful talent of the designing craftsmen, and you business men can do a deal to see that those boys and girls do not escape with that talent wrapped up in a napkin.

STATE-AIDED VOCATIONAL SCHOOLS OF NEW JERSEY.

The vocational school law of New Jersey, passed 1913, has now been taken advantage of by seventeen districts, including four counties. Fifty-one schools or departments have been organized varying in size from one to twelve classes, with a total enrollment of 7,000 over fourteen years of age.

Machine shop work, cabinet-making, carpentry, printing, electrical work, drafting and textile work, are some of the subjects being studied thus far by the 700 boys in the day schools. Five hundred girls are doing work in cooking, sewing, millinery, household accounting and so on. In Atlantic, Cape May and Cumberland counties, there are 200 boys and girls who are doing all day or part-time work in agriculture. There are evening trade classes for men, supplementary to their employment. These are largely attended, nearly 1,600 men having been enrolled the past year. Such subjects as machine shopwork, carpentry, industrial mechanical drawing, printing, plumbing, blueprint reading, industrial mathematics, electric work, electro-plating and agriculture are taken up. In the evening classes for women over 3,000 are enrolled, nearly half taking sewing and dressmaking.

A unique feature is the organization of the four county vocational schools. Here agricultural work is emphasized. In one there is a director in charge of four men, all practical farmers with agricultural college training. These work with boys and young men who have left the regular public schools and are working on farms. During the first year, about 150 boys took the work, over half of whom carried to successful completion some project of considerable financial importance. The gross returns of one boy, who cared for 323 peach trees, were $1,151.75, his net proceeds, $851. The teachers in these county schools gave valuable help last summer in stamping out the hog cholera epidemic.

Some of the arguments for the introduction and extension of vocational education in New Jersey, as stated in the educational bulletin, issued by the Trenton Department of Public Instruction, are as follows:

1. The industries and agricultural interests of New Jersey demand that she keep pace with other progressive states in the matter of vocational education.

2. The vocational schools reach large numbers of boys and girls who cannot profit by academic high-school work; and thus provide an equal opportunity for all.

3. These schools promote the welfare of the state, for this depends upon its providing citizens with opportunities for education such as they can make use of.

4. The vocational school helps those who have gone to work, by giving part time instruction supplementary to their employment.

5. Vocational schools recognize the vocation of home-making and prepare girls for this.

THE SCHOOL FARM.

We are glad to print the following from the head of the Rural Education Department of Cornell University:

Ithaca, N. Y., April 24, 1916.

Editors of Manual Training and Vocational Education:

On page 646 in the April number of your magazine occurs the following statement, "While many believe that there should be home projects in agriculture as a feature of every high school course in agriculture, the need for work of this sort at home is particularly important where the high school is not fortunate enough to possess a school farm."

The latter part of this statement made without any restriction seems to me to be particularly unfortunate as it gives the impression that for all conditions a school farm is desirable, if not a necessity for teaching secondary school agriculture. It is doubtful whether this statement is justified by the facts that are available in the present stage of development of high school agriculture.

A school farm may serve as a source of laboratory material, a demonstration plot, and for the purpose of giving the pupil vocational experience. Evidently the writer had the last use in mind because he contrasts it with the home project. The problem of securing this experience presents itself somewhat differently to different schools, but for the rural high school the home project has very manifest advantages over the school plot. It fixes very definitely the responsibility for results. This is not always easy where several students are working on the same problem, as is frequently the case on the school plot. Especially is this true with reference to the business or management aspects of the work. Further advantages are: opportunity for a wider range of agricultural activities than is usually possible on the school plot, possibility of undertaking a piece of work of sufficient magnitude to appeal to the adolescent, brings instructors into intimate relationship with the home, and finally makes it possible to keep the student in close touch with his piece of work throughout the growing season or the entire year, if desirable.

The work that has been developed by Mr. Stimson in Massachusetts and the growth of the home project in the states of Pennsylvania and New York have given results that show beyond question that for rural high schools the home project is a much more satisfactory way of securing vocational experience than the school plot.

Yours truly,

J. A. Works.

A NORMAL SCHOOL FINDS A SPECIAL FIELD.

The Kent State Normal College has just provided a new fire proof building for its manual arts department which will give it an opportunity that is, probably, unique among the normal schools of the

country. If present plans are fully carried out this school will make a specialty of training young men for teaching farm mechanics, blacksmithing, farm building construction, and farm architecture, as well as the more elementary work in manual training. President McGilvrey and Professor Van Deusen have seen the present need in country schools and are preparing to meet it. The department moved into the new building early in May, but only a part of it is yet equipped. Some idea of the extent of the plan can be gained from the following figures: The main floor space 60 ft. by 90 ft. is being divided to provide a room for each of the following: Bench work in wood, machine woodworking, wood-finishing, demonstrations, drawing, printing, office, tools, and a washroom. The building is on a side hill, so that below these in the rear will be ample storage space and an excellent room 38 ft. by 60 ft. with very high ceiling, which will probably be equipped as follows: About half of the room will contain fixed equipment, including 24 forges, a drill press and an engine lathe. The equipment in the other half, except two long benches against the walls is to be movable. The intention is to use this room as a shop for farm mechanics, and in addition to forge work, provision is to be made for harness work, pipe fitting, sheet-metal work, cement work, the study of and care of oil engines, farm tractors and other farm machinery.

In every other respect also this school is well equipped to undertake this special line of work. It has a fine department of agriculture developing, all the science courses and pedagogy courses and practice teaching courses needed to back up such a specialty, and it evidently has the spirit of a new and progressive institution.

THE N. E. A. MEETING IN NEW YORK.

The annual convention of the National Education Association is to be held this summer in New York City. The dates are July 1-8. The bulletin just received indicates that the department of Vocational Education and Practical Arts will be provided with a rich program. In addition to the two regular sessions, the department plans to hold joint sessions on (1) drawing, design and domestic arts, (2) home economics and household arts, (3) architecture, mechanical drawing and ceramics. There will also be a joint session with the American Home Economics Association.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

FIRELESS COOKER.

An inexpensive, yet efficient fireless cooker is shown in the accompanying drawing. The materials required are as follows:

Case, a 45-pound lard can, diameter 12½", height 18".

Insulation, wood ashes, thoroly dried, or some other non-conductor of heat.

Cooking compartment, a pail or other vessel with straight sides and slightly larger in size than the cooking vessel.

Radiator, stove lids, soap stone or concrete disk.

Cooking vessel, with a tight-fitting cover. Aluminum is preferable.

Hooks, bent into shape from heavy wire.

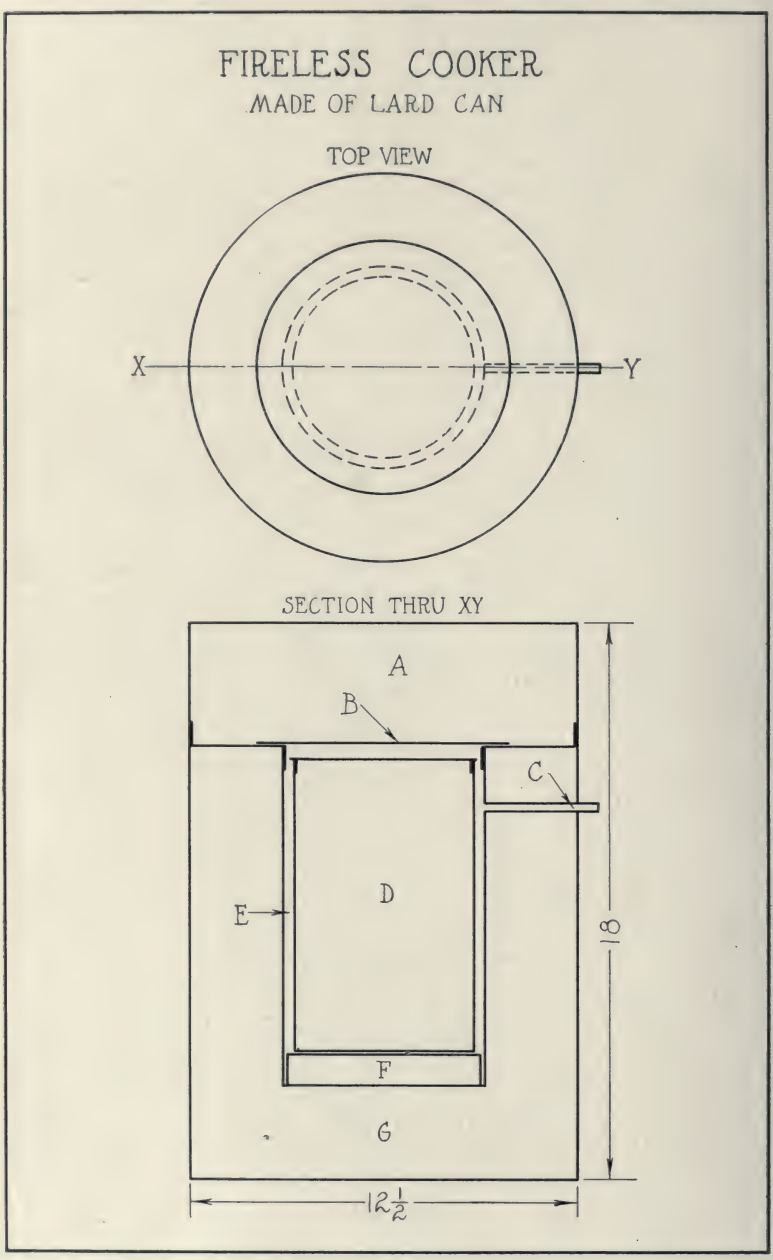
Insulating cushion made of undyed, closely-woven cloth and filled with hair-felt, wool, cotton, granulated cork or shredded newspaper.

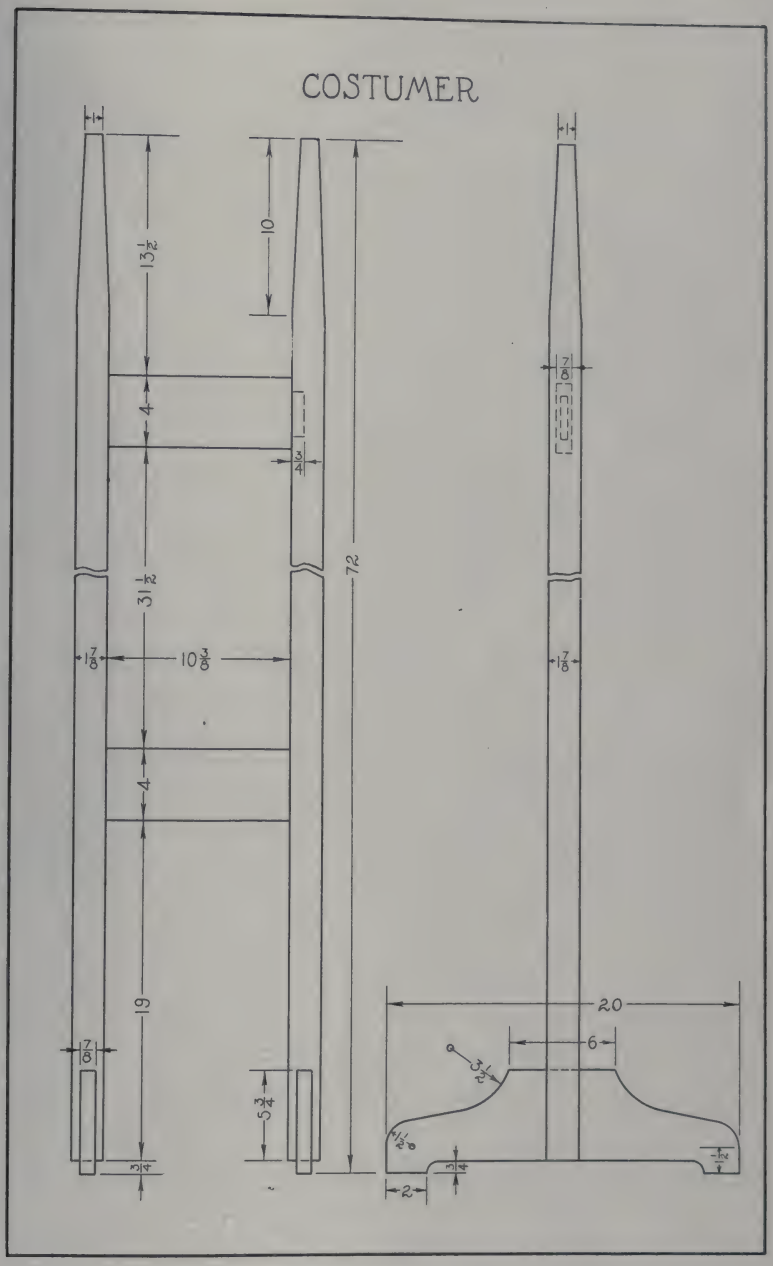
Vent tube, a tight metal tube such as an oil can spout.

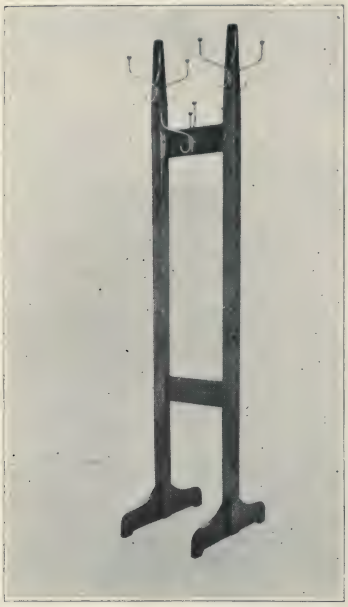
Covers, for insulation, and for cooking compartment.

The cover for the insulation is made from a lard can cover, and crimped over an iron wheel or other round object with a mallet, until its size is decreased sufficiently to fit inside the case. A hole is then cut in the center to fit the cooking compartment, E. The cooking compartment is then punctured with a nail about 1" from the top, and the vent, C, is soldered over this hole. The compartment is then held in the case about 4" from the bottom to locate the point where the vent is to pass thru the side of the case, after which a hole of the right size is punctured at the point indicated. Ashes are now poured in the case to a depth of 4" at G; the compartment is put in place and more ashes poured in until level with the top. The cover for the insulation is now soldered to the inside of the case and to the top of the cooking compartment. This must be carefully done to prevent the ashes from becoming wet from water that may be spilled in the cooker or from condensed steam. Also solder around the place where the vent projects thru the case. The radiator, F, may be cut to shape if made of stone, or it may be cast of concrete in a mold 1¼" deep by the required diameter. A U-shaped wire is pressed into the concrete before it has set to provide a means of lifting the disk with the wire hooks. The cooking vessel is usually made of aluminum and purchased ready made. It should just fit inside of the cooking compartment. The cover, B, may be any tin cover which will fit down closely. The space A, is filled with the insulating cushion when the cooker is in use. At other times the cushion is placed where it will dry out. This cushion should be not less than 4" thick and slightly larger in diameter than the case, in order to fit snugly when the cover of the case is put on.

—C. E. HANSON, A. and M. College of Texas.


FIRELESS COOKER
MADE OF LARD CAN
TOP VIEW
X
Y
SECTION THRU XY
A
B
C
D
E
F
G
18
12½


COSTUMER
1
13½
10
4
4⅜
31½
72
1⅞
10⅜
4
19
⅞
5¾
¾
⅞
20
6
3½
4½
¾
2



COSTUMER.

Nearly every grammar grade class at some time has one or more members in need of a costumer. The drawing and photograph show such a piece made by an eighth grade boy in the classes of Raymond Bealer, Baltimore, Md. This costumer was made of quartered red oak, finished with one coat of dark filler, three coats of shellac, sanded between coats, and finally rubbed down with pumice stone and oil.

AUTO REPAIR CART.

Every one who has had to get under a car for repairs will appreciate the value of this device for use in the home garage. It is light, narrow and easily moved wherever desired by means of the feet, leaving the hands free.

—J. M. Gray, Cleveland, Ohio.

MILK BOTTLE HOLDER.

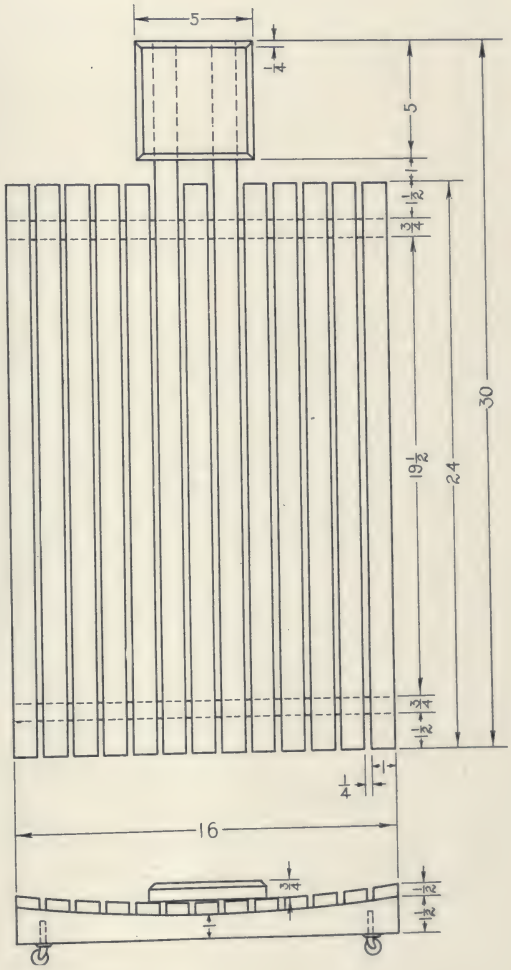
The accompanying drawing illustrates a project which has been used in the contributor's classes for the past five years, during which time about one thousand have been made. The design has been modified to hold as many as five bottles, and will hold any size from one-half pint up to two quarts. The cover is intended to keep dirt, cats and dogs away from the bottles. A lock may also be added to prevent loss. The holder is made of oak and braced with brackets or dowel pins inserted across the grain. The openings may be cut with either an extensive bit or a coping saw.

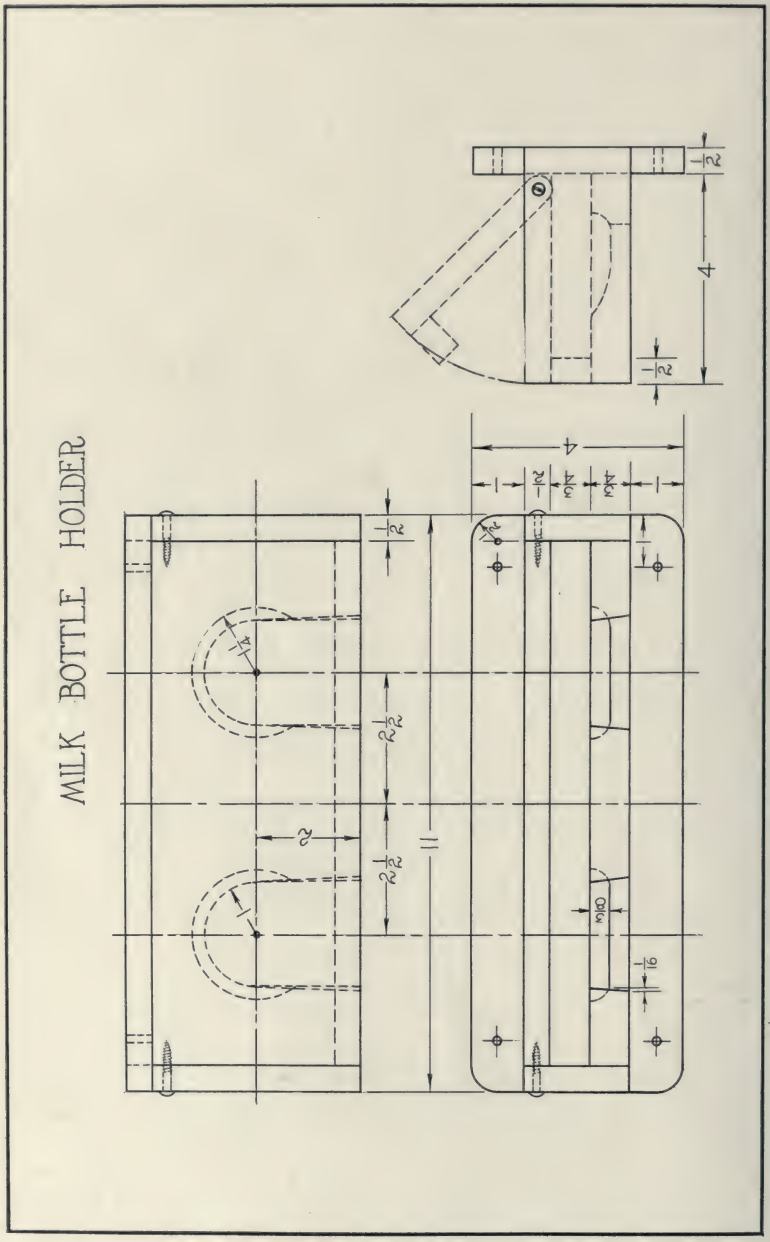
A SCALED TEE SQUARE.

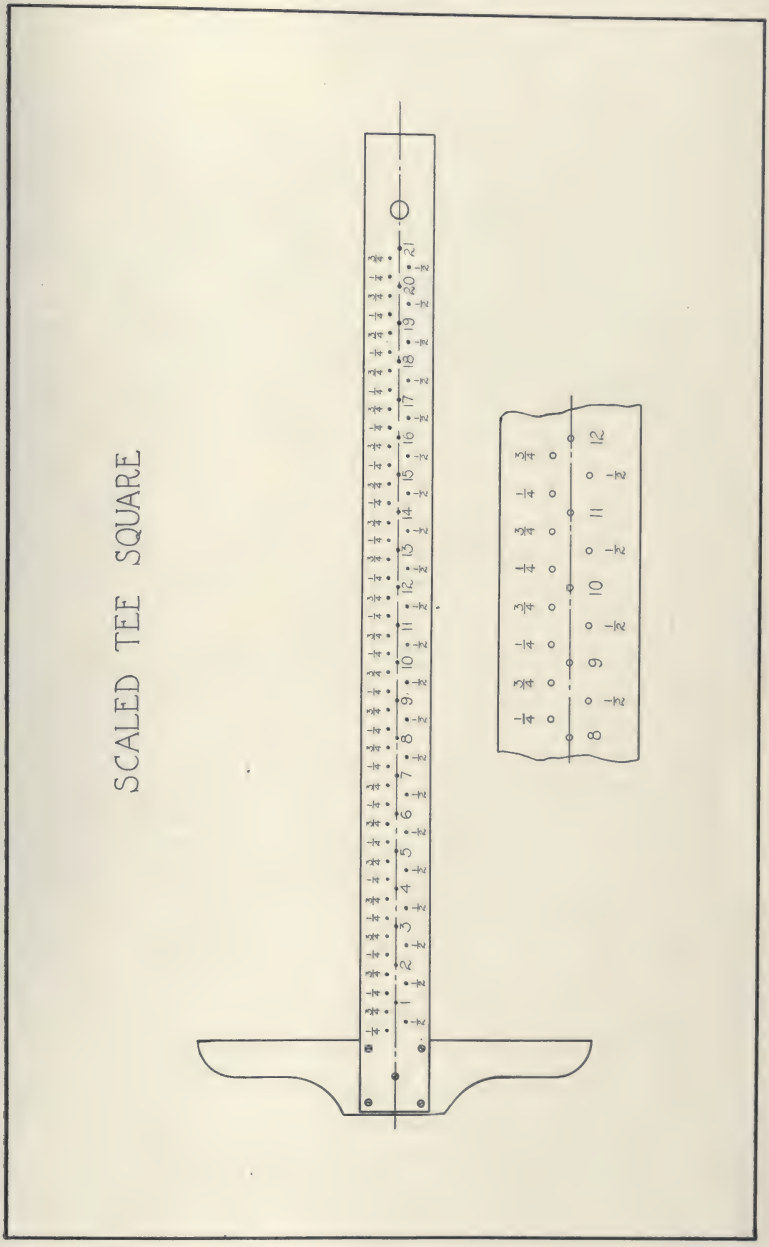
This project may be used, especially by the shop teacher, for laying out work. To gage for width along a piece of stock, a pencil is inserted at the proper hole and the head of the square held firmly against the edge of the board as it is moved along the edge. Or it may be used as any square would be for squaring across the grain. Finally, if turned over, it may be used as a compass by placing the larger hole over a wooden peg or a brad, the pencil being in the desired hole. Almost any circle may be drawn, from ½″ diameter up to 3′. Other uses will suggest themselves to the teacher who possesses one.

—Edward A. Hilgren, Cleveland, O.

AUTO REPAIR CART

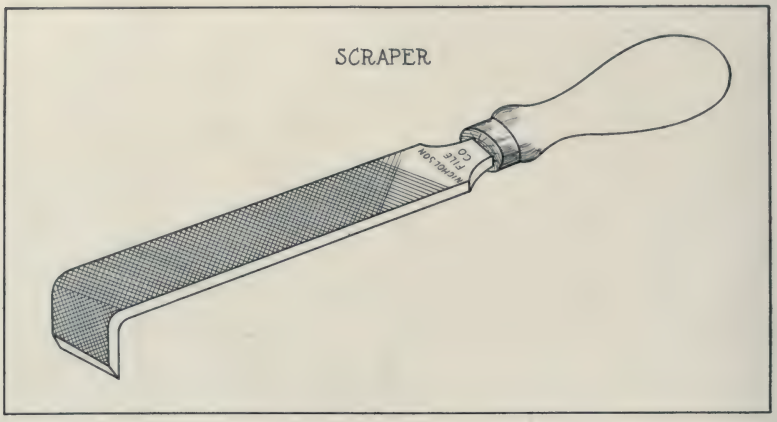


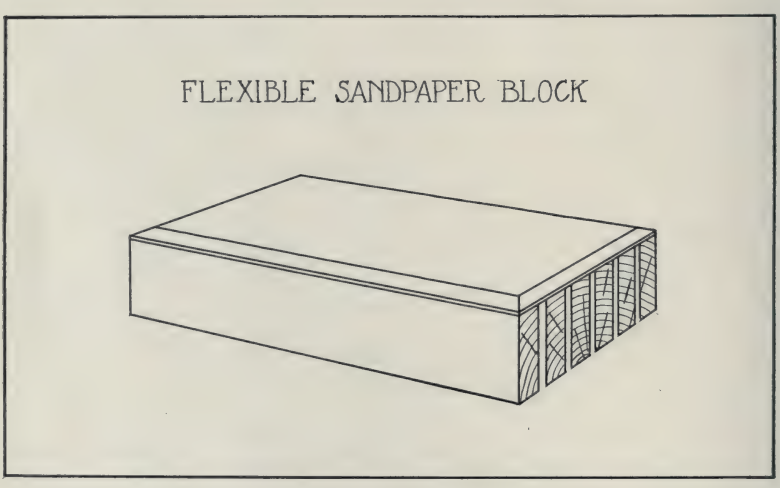

MILK BOTTLE HOLDER
4
11
2½
2½
2
1
1
1
1
1
1
1
1
½
½
½


SCALED TEE SQUARE

SHOP AIDS.

The glue scraper shown is easily made from a discarded file. It will serve equally well to remove paint, or the bark of trees. It has been made and used by the contributor for over twenty years.



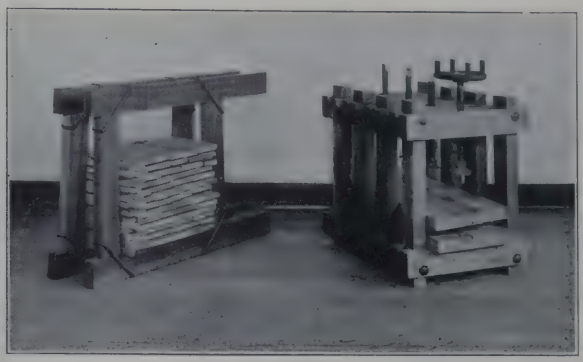


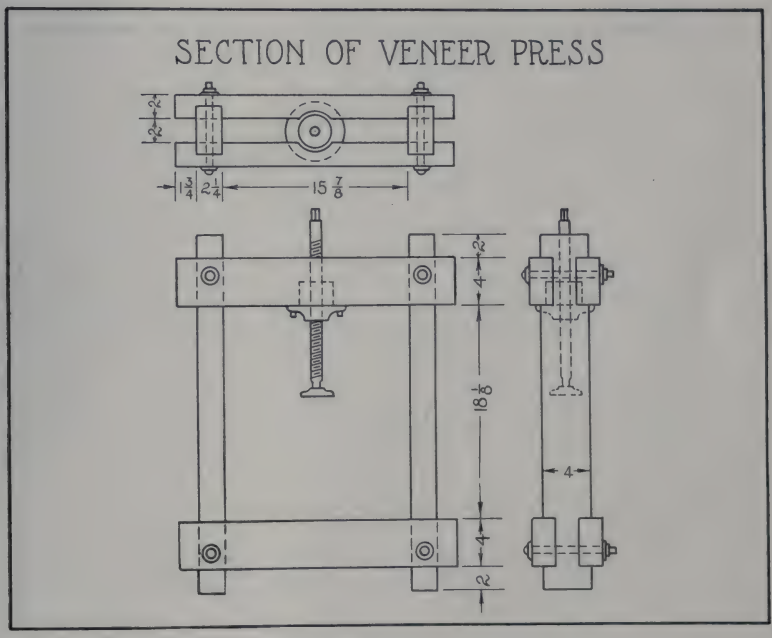
The flexible sandpaper block is designed for use on straight, irregular or curved surfaces. It is made by planing up a block ⅞″x3″x5″, and glueing to this a piece of single-thick belting. When the glue has dried, a series of saw kerfs are cut thru the wood to the belting, leaving in effect a series of narrow strips glued to a pliable backing.

—Francis L. Bain, Dorchester, Mass.

VENEER PRESS.

Practically every high-chool class has some work which can be glued most efficiently in a veneer press. The illustrations show a home-made press which has given satisfactory results. The photograph shows two wooden slabs be-



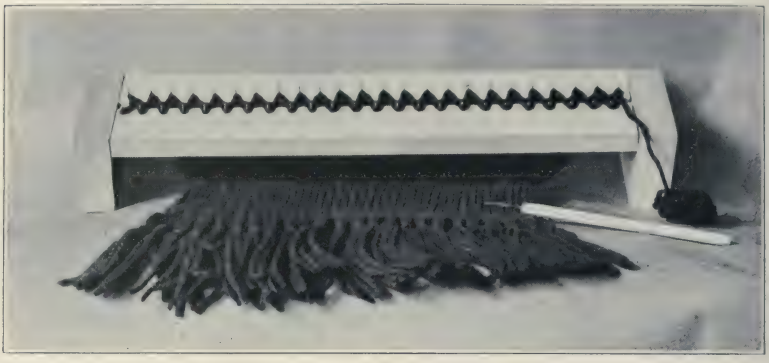


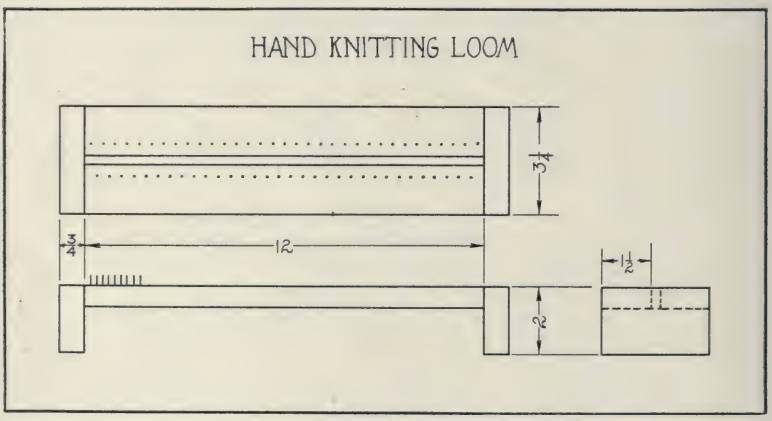
tween which the work to be glued is placed. A better arrangement is to have these plates made of cast iron. At the right of the photograph is shown a simple clamp for glueing drawing boards, etc.

—NEWTON VAN DALSEN, Neenah, Wis.

HAND KNITTING LOOM.

A simple woodworking project is given herewith. The construction is evident from the drawing. To weave on this loom start yarn on an end peg and





loop once around each peg, going from one side to the opposite, keeping the yarn towards you.

For the second row, catch the yarn on the pegs above the first set of loops and lift each loop over the top row with a blunt needle. Continue in this manner until the scarf is of the desired length. Unthread loom by passing end of yarn thru loops by means of a darning needle. The fringe is made by passing three strands 8″ long, thru opposite loops and tying.

Use a 4-ply Germantown yarn, and ¾″ brads for the pegs.

—GRACE CRAIG, St. Louis, Mo.

REVIEWS

Historical Essays on Apprenticeship and Vocational Education, by Jonathan French Scott, instructor in History at the University of Michigan. Published by The Ann Arbor Press, Ann Arbor, Mich.

This pamphlet is the outgrowth of a thesis submitted for the degree of doctor of philosophy at the University of Wisconsin. It treats of the development of apprenticeship as a gild requirement, the journeyman of the fourteenth, fifteenth and sixteenth centuries, the Statute of Artificers in the time of Queen Elizabeth, and the enforcement of this statute. Then follows a chapter on apprenticeship as an educational system, one on the decline of the English apprenticeship system, and a final chapter on economic reasons for vocational education in America.

Now that the first flurry of enthusiasm for vocational education is past and men everywhere are looking for facts, these scholarly chapters on apprenticeship and related subjects are most welcome. The author concludes that the great reasons for vocational education are fundamentally economic ones and that from the viewpoints of the manufacturer, the workingman and the nation, vocational education is necessary.

Agricultural Drawing and the Design of Farm Structures, by Thomas E. French and Frederick W. Ives. McGraw-Hill Book Company, New York. 7½x 10 inches; 120 pages; price, $1.25,net.

The authors intended this book not as "a course in drawing, but as a textbook for students of agriculture and agricultural engineering." The book deals in a thoroly modern way with the different kinds of drawing. The theory and technic of working drawings of farm appliances, drawings of farm structures, maps, topographical drawings and pictorial drawings are carefully presented, together with a wise choice of subject-matter. The drawings of the problems indicate that they were designed from a practical standpoint. A considerable portion of the content of this book covers a field not heretofore satisfactorily treated.

Country Plumbing Practice, by William Hutton. David Williams Company, 239-41 West 39th Street, New York. 5¾x8¾ inches; 310 pages; price, $2.00.

Teachers and students of plumbing, especially those in consolidated rural schools and township high schools, will find in this book a thoro treatment of country plumbing practice. It is simply tho carefully written. The fact that it is intended for use by the trade indicates in itself the author's practical viewpoint. Briefly its purpose is to offer assistance in designing and installing appliances in suburban and rural houses and out buildings.

The mechanical details and the various methods of installation of different types of power plants are first presented. These are followed by hints for the proper selection of the water supply. The distribution of the water supply to the various types of suburban and rural buildings is followed by explanations

of various satisfactory methods of sewage disposal. Incidentally such problems as the laying of tile and iron drains are discussed. Structural features of country plumbing systems receive careful attention. There are examples of work in country schools, cottages, farm plants and summer hotels. A valuable addition is the treatment of the installation of plumbing in old houses. The book is illustrated with line drawings and half-tones.

Mechanical Drafting, by Charles B. Howe. John Wiley and Sons, New York. 10¾x8 inches; 147 pages; price, $1.75.

Many teachers of mechanical drawing have long felt the need of a book which could be used to reinforce their presentation of subject-matter, and supply them with data, conventions and problem sheets. Such is the purpose of this book. No course of study is presented, but the student will find it valuable in assisting him to a knowledge of the principles of mechanical drawing and their practical applications.

The various divisions of the book are planned and arranged so that the student will acquire a large amount of knowledge and skill in drafting rather than in the solution of geometric problems which are seldom used in drafting-room practice.

Under the head of geometric drawing, the simple principles and application of orthographic drawing and developments are presented. This is followed by practical working rules and suggestions, and many illustrations treating the following divisions of mechanical drawing: machine, working, architectural, and plot and map drawing, pictorial representation and sketching, and blueprinting.

Electrical Measurements and Testing, by Chester L. Dawes. John Wiley & Sons, New York. 8x10½ inches; 88 pages; price 75 cents, net.

This is a loose leaf manual intended to accompany Timbie's *Measurements in Direct and Alternating Current,* and Karapetoff's *Elementary Electrical Testing.*

The manual comprises a series of laboratory experiments. The experiment sheets are illustrated, and space is left on each one for answers to related questions. A few single experiments with batteries, wiring and switches introduce the work. These are followed by a rapid development in quite advanced measurements and tests of transformers, generators, motors and other electrical apparatus.

Personal Efficiency and Selling, by Irving R. Allen. La Salle Extension University, Chicago 6x8½ inches; leather binding; 311 pages.

This volume is from the library of Business Administration published by this school of business. It is of special interest to salesmen and anyone interested in selling. It deals in a forceful and inspiring way with the "selling personality" and the "personal equipment" of a successful salesman. The larger part is devoted to sales administration, the problems of the sales manager, selling policies, sales records, training of salesmen, etc. It is easy to read, being written in a conversational style.

Materials of Machines, by Albert W. Smith. John Wiley and Sons, New York. 5x7½ inches; 215 pages.

The book is divided into two parts. The first part deals with elementary metallurgy and with the manufacture of materials. The chemical properties of fuels, electric furnaces, refractory materials for fire brick, and the metallurgy of iron, steel, copper, and aluminum are some of the subjects treated.

The second part of the book deals wtih the properties of materials, explaining why certain kinds of metals fill specific needs better than others. The testing of materials is thoroly discussed. The treatment of the different kinds of iron, steel, and non-ferrous alloys is valuable because not only are the peculiar characteristics of each fully described, but a practical concrete example of each is added to show the application.

The contents of this book should be of interest to anyone who designs or constructs machines; and to a metalworking teacher who desires to correlate some information of this type with the regular shop work.

How to Make Low-Pressure Transformers, by F. E. Austin, Hanover, N. H. 4¾x7¼ inches; 17 pages; price 40 cents. Published by the author.

This is the second edition of this little book, bound in cloth. It contains additional subject-matter pertaining to the principles of transformer constructon.

Practical Shop Mechanics and Mathematics, by James F. Johnson. John Wiley and Sons, New York. 5 x 7 inches; 130 pages; 81 figures; price, $1.00 net.

This book covers just the field that its title indicates. It is admirably adapted for elementary use in all types of schools where the shops are of a vocational nature. It is also well adapted for individual home study.

A fair idea of the type of content of this book may be had by the enumeration of some of the chapter heads: "Measures and Weights and Measuring Instruments," "Pulleys and Belting," "Tooth Gearing," "Stress and Strain," and "Shop Trigonometry." The various principles of mechanics and problems related to them are well illustrated. These illustrations help make the book very concise and readily understood.

Engineering as a Career. A series of papers by eminent engineers, edited by F. H. Newell and C. E. Drayer. D. Van Nostrand Co., New York. 5 x 7 inches; 226 pages; price, $1.00 net.

This book presents for the guidance of youth and their advisers some of the facts usually hard to obtain concerning engineering as a life work. Over a score of engineers and experts prominent in the United States have written separate articles telling what they believe are the personal and educational qualifications required for success and what opportunities await the young man who chooses engineering as a career. The inspiration for the book came in response to numerous inquiries from high-school teachers and others who are frequently called upon to advise young men in their choice and preparation for a professional life. It was found from experience that many youths who planned to study engineering had only the most hazy ideas of what is involved, nor were their teachers and parents much better informed. The book meets a present-day need.

Examples in Magnetism, by F. E. Austin. Published by the author, Box 441, Hanover, N. H. 4¾x7½ inches; 90 pages; price, flexible leather, $1.10.

This book is intended to act as a guide for students beginning the study of electrical engineering. It is adapted for either school or home study. The general aim is to develop correct and logical thought. Problems are first stated, and then carefully solved, step by step. Related problems of a similar nature follow, together with problems dealing with some particular phase of the same subject.

Woodwork for Little Folks, by Frank H. Pierce. Charles Scribner's Sons, New York and Chicago. 11x14 inches; 56 pages; price, $1.00.

Teachers of coping or fret-saw work will welcome this book of patterns. It should be of time and labor-saving value to instructors. The book consists of 28 large charts of patterns, with brief working directions for the model or models on the page opposite. The problems include birds, animals, people, carts, furniture and mechanical toys. These projects are suitable for children between the ages of six and eight years. They are adaptable for either school or home work.

Directions for Designing, Making, and Operating High-Pressure Transformers, by F. E. Austin. Published by the author, Box 441, Hanover, N. H. 4¾x7½ inches; 21 illustrations; price, 65 cents.

A new edition of this book has appeared in a cloth binding. It contains the fundamental theories, methods of construction, and practical hints relating to the making and operation of high-pressure transformers.

RECEIVED

Industrial Education, a report of the Committee on Industrial Education at the Twentieth Annual Convention of the National Association of Manufacturers, New York City, May, 1915. Contains reports of new legislation in Pennsylvania and Wisconsin. Reprinted for distribution by Bureau of Education, Washington, D. C.

Study Outlines of Domestic Economy Course, prepared by the School of Domestic Economy and Division of Home Welfare of the University of Texas, especially for use by Parent Teacher Associations. Bulletin No. 55, 1915, University of Texas, Austin.

Art in High Schools and Drawing and Shop Work in Elementary Schools, from the *Seventeenth Annual Report of the City Superintendent of Schools*, 1914-15, *New York City*.

English for Boys, by Homer J. Smith, 414 Greenfield Avenue, Milwaukee, Wis. A pamphlet on material and method. Price, 5 cents.

Ten Lessons in Woodworking, pamphlet prepared by W. Melvin Fox at the request of the State Director of Industrial Education of New Mexico. Published by the State Board of Education, Santa Fe, N. Mex.

MANUAL TRAINING AND VOCATIONAL EDUCATION

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FOREWORD

CONTINUING the effort initated last September, we again present to our readers a group of articles most of which have a direct bearing on methods of teaching the manual arts and the organization of subject-matter.

In the initial article *Miss Alberta M. Wolgamott* gives a summary of the present situation with reference to the moving picture as a means in industrial education. She not only offers helpful suggestions to users of moving picture reels but makes clear certain limitations which are also important to keep in mind. The article looks toward the perfection of the moving picture machine and its wider use in education.

Every reader of the article by *Charles W. Clark,* published in our April issue will be glad to read his second article which appears in this issue. Mr. Clark's discussion of "Getting the Pupil Started on His Job," grows out of experience in teaching high school boys in Syracuse, N. Y. In a brief article *A. R. Spillman,* supervisor of manual arts, Davis County, Utah, gives suggestions to the teacher of mechanical drawing.

Many extensions of the manual training course reaching out toward modern industrial methods have been tried in and near New York City. In this issue we present the point of view of *A. W. Garritt,* and show projects that have been worked out under the congested conditions of school shops in a great city.

We are quite sure that shop teachers looking for practical suggestions will find them in the article on glueing by *Harry L. Hurff,* instructor in charge of the factory shop at Bradley Institute.

Any of our readers who are interested in the question of the effective use of a school farm as a means in high-school agricultural education will find one answer in the article by *Robert J. Teall,* of Los Angeles, Calif.

To *Harris W. Moore* we are indebted for a fine summary of the proceedings of the recent meeting of the Eastern Arts Association, held at Springfield, Mass.

RURAL SCHOOL PROJECTS COMPETITION.

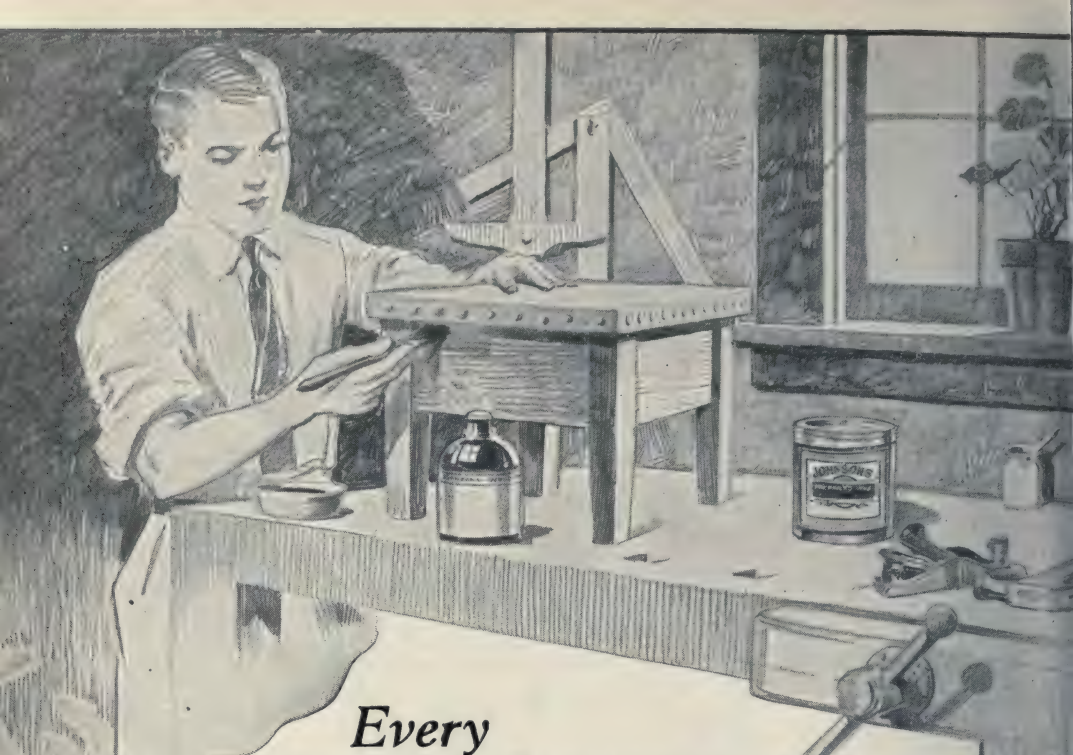
This competition in our Shop Problems Department closed March 30th, and the following prizes were awarded:

1st., Leon Baxter, St. Johnsburg, Vt. 2nd., Geo. Brace, St. Paul, Minn. 3rd., Harry Chellman, Pittsburgh, Pa. 3rd., P. H. Herron, San Diego, Calif. Honorable mention: V. E. Sayre, University, N. D. H. S. Record, Deer River, Minn.

Two third prizes were awarded. All of the above material will appear in future numbers of this Magazine.

This Magazine is kept for sale at McClurg's in Chicago, and Brentano's in New York.

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Every Amateur Craftsman

has experienced the disappointment of having a beautiful piece of furniture—one on which he has spent many hours—spoiled with improper finishing. Johnson's Wood Dye and Prepared Wax are especially adapted for furniture work—they are being used in many of the finest furniture factories in the country. The most inexperienced can use them successfully.

JOHNSON'S WOOD DYE

is the best stain to use for coloring the wood. It goes on easily, without a lap or a streak—penetrates the wood without raising the grain—is made in 17 standard shades. Johnson's Wood Dye is unequalled for staining reed and wicker baskets.

JOHNSON'S PREPARED WAX

is the proper finish to use over the Dye. It imparts a hard, dry, velvety finish of great beauty and durability. It is impervious to water, dust, scratches, heel marks, finger prints, etc. The finish obtained is sanitary, durable and beautiful.

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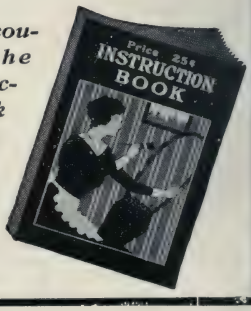
Please send me free and postpaid a copy of your new Instruction Book on wood finishing.

Name _____

Address _____

City and State _____

Send this coupon for the new Instruction Book telling how to finish new work and refinish old work



FIELD NOTES

A meeting of the Southeast Texas Manual Training Association and the Southeast Texas Home Economics Association was held in Houston on May 5 and 6. On Friday evening a manual training round table was held; short discussions of the following subjects being presented: "Machine Cabinet Shop Equipment, Methods and Use of Jigs," T. A. Butler; "Should Mechanical Drawing Be Taught Below the Seventh Grade?" A. L. Pearce; "Class Demonstration and Effective Use of Note-books," O. Tearney; "Ways and Means of Improving the Status of Manual Training Teachers in This Section of the State," O. A. Hanzsen; "Demonstration in the Use of a Lantern in Teaching Manual Training," C. J. Sherman.

On Saturday morning a general meeting of the manual training and home economics teachers was held, at which O. A. Hanzsen, head of manual training at the State University of Texas, delivered an address on "How Texas High Schools Can Increase their Credit Standing with the State University." Superintendent P. W. Horn, of Houston, spoke on "The Relationship of Manual Training and Home Economics to the Remainder of the School Work."

TEACHERS OF PRINTING IN CONVENTION.

About seventy-five printing instructors and others interested in this rapidly developing school subject, gathered in Hotel McAlpin, New York City, on April 17, 18 and 19, to establish the Eastern District of the International Association of Teachers of Printing. The meeting was the first of its kind and was brought about to consider the status of printing as a public school subject and to discuss its future possibilities. The list of speakers included the foremost men in the trade, as well as the leading teachers of printing in the various schools of the East. Howard Farmer, Director of "The Polytechnic," a London institution, was a very interested attendant and expressed admiration for American progressiveness and its advancement in placing printing instruction in the public schools. An opinion obtained generally among those present and those who spoke that printing, when properly taught, could be made the vehicle for every common school subject and was equally as valuable for cultural as for trade training. The papers and addresses were recorded and the association expects to prepare them for distribution.

A constitution and by-laws were drawn up and adopted and the following were elected officers for the first year: President Joseph A. Donnelly, of Public School No. 158, Brooklyn, N. Y.; first vice-president, Frank K. Phillips, director, Typographic Arts School, American Type Founders Co., Jersey City, N. J.; second vice-president, Edwin Cooper, printing instructor, Bridgeport, Conn.; secretary, R. A. Loomis, printing instructor, Wm. L. Dickinson High School, Jersey City, N. J.; treasurer, H. E. Parker, printing instructor, Vocational School for Boys, New York City.

VOCATIONAL OPPORTUNITIES IN FORT WAYNE.

The development of the work in the Fort Wayne Public Vocational School, Fort Wayne, Indiana, is a source of gratification to those responsible for its success. In addition to strong courses in manual training, day and evening courses are also given in vocational subjects for both boys and girls. In the day school 65 boys are enrolled in the trades, and 35 girls are taking courses in cooking, home making, millinery and dressmaking. The attendance of men in the night classes is as follows: Printing for apprentices, 20; auto construction and repair, 60; machine shop mathematics, mechanics and drafting, 70; carpentry and architectural drawing, 24; air brake construction and repair, 45. Many of the men come from the Pennsylvania Railroad shops, Fort Wayne Electrical Works, the Brass Foundry and other similar concerns. Next year courses in the following additional trades will be taught in both the day and evening class: machinists, moulders, plumbing, sheet metal, and such others as 15 students may call for.

The board of education has leased the Kerr-Murray plant for two years at a yearly rental of $2500. It is located in the center of the city, easily accessible from all sides. Young men from

(*Continued on p. VI.*)

the country are also taking advantage of the work. It is noteworthy that the attendance in the high school has been increased rather than lessened by starting this vocational school. W. E. Gordon, director of the school, is enthusiastic over the prospects.

ECONOMIC PRIZES.

In order to arouse an interest in the study of topics relating to commerce and industry, and to stimulate those who have a college training to consider the problems of a business career, a committee of which Professor J. Laurence Laughlin, University of Chicago, is chairman, has been enabled, through the generosity of Messrs. Hart, Schaffner & Marx, of Chicago, to offer in 1917 four prizes for the best studies in the economic field.

In the choice of subjects offered, one especially appeals to our readers, namely, "What forms of education should be advised for the elevation of wage-earners from a lower to a higher industrial status in the United States?" The first prize is $1,000, and the contest closes June 1, 1917. Fuller particulars will be furnished upon application.

We are still hearing echoes of bird house contests that have been held in various places. In Kalamazoo, Michigan, more than 70 bird houses were shown in an exhibit lasting for one day. The exhibit was conducted by the boys' division of the Y. M. C. A. under the leadership of the secretary. The Liberty Bell Bird Club of Philadelphia, which held a display of houses and bird pictures in connection with the local exhibit, increased its membership by the addition of 250 Kalamazoo people as members of the organization. The club was organized three years ago as a purely philanthropic affair, and has now almost one million members including men, women and children in all sections of the United States. It is the largest organization of the kind in the world.

The interest in kite-flying contests rivals that in bird house contests. These two out-of-door sports make a strong appeal to boys, and especially so because their greatest activity naturally follows a season of life indoors. Quite a feature was made of this sport at the Detroit Recreation Centers this spring, where teams were formed for the kite-flying exhibition. The recreation commission sent drawings to the various public school manual training departments with the idea of aiding boys in constructing their kites for "Kite Day," which was held at Northwestern field on April 29. Over 1000 entries were made. A number of Chinese, to whom "Kite Day" is a repetition of a national holiday, entered quite a few intricate and curious designs for which they are famous, among them being the dragon. The contest was governed by rules and regulations, thus guaranteeing fair play to all contestants.

Perhaps the most enthusiastic kite-flying contest this past season was the one held in Pittsburgh, where 3,000 boys, with kites upon which they had been working for weeks, gathered in Schenley Park to celebrate their second annual "Kite Day." The fame of their first celebration, which was witnessed by 15,000 persons, had reached Miss Julia Lathrop, head of the children's bureau of the department of labor, Washington, D. C., and she sent Mrs. Max West, the national authority on child welfare and author of a number of books on the subject, to witness this year's celebration. In addition to Frank H. Ball, director of manual training, and his many assistants, a corps of 100 aids from the University of Pittsburgh and the Carnegie Technical Schools assisted in looking after the details of the day's program.

Many new courses are to be offered this coming summer at Johns Hopkins University to enable teachers in the Maryland public schools to meet the requirements of the new general education law which becomes effective on June 1. These courses include lectures on educational administration and supervision, teaching in high schools, and also instruction in pedagogy and school management, and will make it possible for every person coming under the jurisdiction of the new law to secure the qualifications required by it. The total of 75 courses offered

(*Continued on p. VIII.*)

SPECIAL SUMMER COURSE

IN

SILVERSMITHING

The great popular vogue for hand wrought silver and copper is creating a demand for classes in this delightful art. You will be certain of large enthusiastic classes if you can teach both the elementary and advanced work in these ductile metals.

The summer course for Manual Training teachers and others of limited time opens at the Guild on Monday, July 10th. This is a specially arranged, personal instruction course of 40 lessons in actual work. Both beginners and advanced teachers will find this series of lessons very valuable and very complete in just the work they want and need. Any article involving the processes under consideration may be selected.

Our instructors are practical silversmiths who have had years of experience in producing hand-wrought silverware. And every process—every method—every treatment—is thoroly familiar to them.

The forty full-day lessons—from 9 A. M. till 5 P. M.—will give you a comprehensive, working and *teaching* knowledge of the modern as well as the ancient ways of working the soft metals.

TEACH SILVERSMITHING
COMMAND MORE SALARY

Make yourself more valuable to your school—command a larger salary by teaching this popular art—silversmithing. Write today for full information, terms, etc.

THE SILVERSMITHS GUILD OF EVANSTON

1020-1022-1024 CHURCH ST. EVANSTON, ILL.

Operated in connection with the noted studios and shops of Mulholland Brothers, makers of the famous EASTERLING Hand Wrought Silverware. Students have access to these shops.



FIELD NOTES.

(*Continued from p. VI.*)

covers domestic science, domestic art, manual training, the money market and the European war, social reform, and playgrounds and recreation, in addition to languages and sciences.

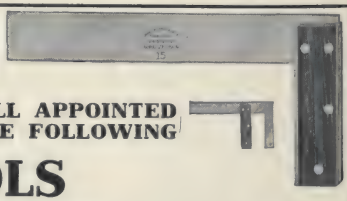
The poster competition announced by the Society for Electrical Development, Inc., carrying a grand prize of $1,000, together with four lesser prizes aggregating a total of $2,2000 in prizes, will give a stimulus to students of poster making. The design receiving the grand prize will be used in the national electrical celebration to be known as America's Electrical Week and held in New York City December 2nd to 9th, 1916. It has the support of the leading electrical concerns of the country, and since these companies are continually purchasing art designs to further their advertising campaigns, it is quite possible that many of the designs entered in the competition will be secured for their permanent use.

To fit colored women and girls to enter some of the skilled vocations is the purpose of the National Training School for Girls, Washington, D. C. It was built and financed by colored Americans and is under the direction of Miss Nannie Burroughs, a colored woman. Courses in English, domestic science and art, dressmaking, millinery, manicuring and massage, housekeeping, business, social settlement work and music are given. The school has been in existence only six years, but so well known have their efforts become that they have students from Africa, Jamacia and Haiti, as well as from all over this country.

Next fall a part-time school for apprentices in the printing trade will be opened in Evansville, Ind. This is the first concrete result of the recent vocational education survey. Both employers and union men are in hearty accord with the movement. The pressmen also are seeking part-time instruction for their apprentices, and the next step will be to work out a scheme of instruction for them.

The California Society for the Promotion of Vocational Education and Occupational Guidance has changed its name to Vocational Guidance Society of California, and has decided to publish an annual report. The secretary is Mrs. E. J. Grover, 121 Belvedere St., San Francisco.



THE GENERAL EQUIPMENT OF A WELL APPOINTED WOOD WORKING SHOP INCLUDES THE FOLLOWING

DISSTON TOOLS



D8 Cross cut hand saws, 22-inch, 10 point.
D8 Rip hand saws, 22-inch, 8 point.
No. 14 Adjustable back 14-inch.
No. 70 Dovetail saws, 8-inch.
Web Saws Complete, 14-inch.
No. 10 Coping Saws.
No. 7 Nest of Saws.
No. 36½ Hack Saw Frame and Blade.
Cabinet Scrapers, 3″x6″.
Cabinet Burnishers, Oval, No. 1.
Hand Saw Jointers
No. 28 Triumph Sawsets.
No. 280 Triumph Sawsets.

D3 Saw Filing Guide and Clamp com te.
No. 75 Plumb and Level, 24-inch.
No. 3 Sliding T Bevel, 10-inch.
No. 10 Mitre Square, 7½-inch.
No. 95½ Mortising and Marking Gauges.
No. 31 Screw Drivers, 6-inch.
File Card and Brush.
Perfection Shear Tooth Files, Flat, 10-inch, medium.
Perfection Shear Tooth Files, ½ rd., 10-inch, medium.
Auger Bit Files, 8-inch.
Hunt's Chrome Special 3-square files.



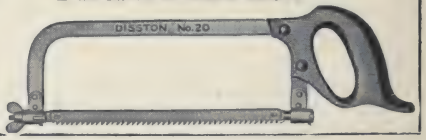
AND ITS BENCH EQUIPMENT

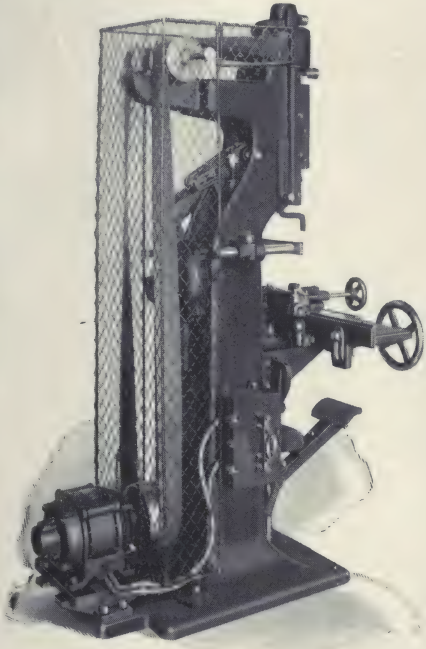
D8 Cross cut saw, 22-inch, 10 point.
D8 Rip saw. 22-inch, 8 point.
No. 4 Back saw, 12-inch.
No. 10 Coping.
No. 7 Nest of Saws.
Cabinet Scraper, 3″x6″.
Cabinet Burnisher, Oval, No. 1.
Hand Saw Jointer.

No. 83 Marking Gauge.
No. 5½ Try Square, 6-inch.
No. 9 Screw Driver, 5-inch.
Perfection Shear Tooth File, 10-inch, flat, medium.
Perfection Shear Tooth File, 10-inch, ½ rd., medium.
Hunt's Chrome Special, 3-square file.
No. 3 Sliding T Bevel, 8-inch.

HENRY DISSTON & SONS, Inc. **PHILADELPHIA**







No. 226B MORTISER

GREENLEE MORTISERS

The most highly developed

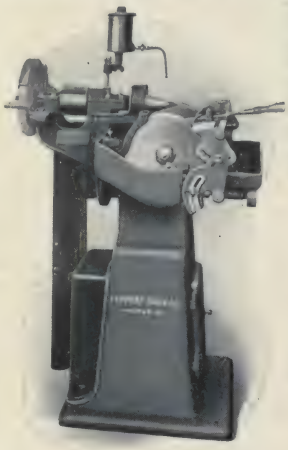
No. 226-B for Manual Training Work
No. 228 Automatic for Vocational Schools

Furnished with shavings fan, electrical equipment, endless belts, and complete belt guards.

It reaches you ready to run.

Greenlee Bros. & Co.,
Rockford, Illinois

Mummert-Dixon Oilstone Grinders

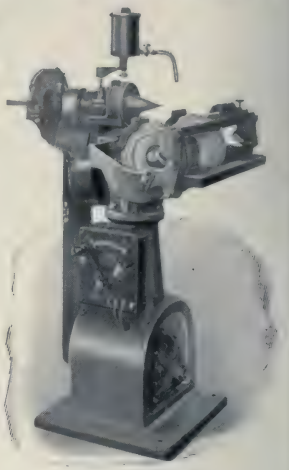


481-B

Are specified by all the leading schools in the United States and Canada as well as foreign countries.

QUICK
EFFICIENT
CONVENIENT
A COMPLETE LINE
HUNDREDS IN USE
EVERY USER SATISFIED

Send for Catalog



479-B

We are the Originators of the Oilstone Grinding System.
"NUFF SAID"

Mummert-Dixon Company, Hanover, Pa.

FOX
"UNIVERSAL TRIMMERS"

TRADE MARK

PRICE, $22.



PRICE, $22.

4A FOX "UNIVERSAL TRIMMER"
FRONT VIEW

Made in three sizes. Especially adapted for light work.
"A Machine for Every Need. ——— A Need for Every Machine."

Write today for new catalog.

FOX Machine Co. **647 Front Ave., N. W.**
Grand Rapids, Michigan

1402 W. Gauson St., Jackson Mich., after May 1, 1916

TRADE NOTES.

The annual meeting of the Western Drawing and Manual Training Association is always looked forward to by the members with anticipation. In addition to hearing helpful addresses and meeting old friends, an opportunity is afforded thru the commercial exhibits to become acquainted with the latest in supplies and equipment. And every teacher and director values this opportunity. At the recent meeting in Grand Rapids, the local firms gave place to the visiting exhibitors in order that each should have ample room. Invitations were extended to visit the plants of the local firms. The Oliver Machinery Co. and Grand Rapids School Equipment Co. made hourly automobile trips to and from the Klingman Furniture Building, where all the sessions and exhibits were held.

MACHINERY AND TOOLS.

The exhibit of the American Woodworking Machinery Co., Rochester, N. Y., was of interest to every one in the market for equipment. They showed their 12 in. Speed Lathe with motor head stock, No. 1 Jointer with direct attached motor drive, and No. 20 Universal Saw Bench, D. C. motor drive. Manufacturers do not always show their heavy machinery at such conventions, but in this case they were even connected with power and could be seen in operation. The walls of their exhibit were covered with framed pictures of all their principal machines. R. T. Maston, advertising manager, Rochester, N. Y., Harry Vaughan, Chicago representative, and George Ely, mechanical engineer, Rochester, were in charge.

One of the firms that is always represented at this Association is Henry Disston & Sons, the well-known saw makers. This firm enjoys the distinction of having exhibited in twelve classes at the Panama Exposition and won the highest award in each class. Under the title of "Hands and the Saw" a series of posters were hung on the walls to show the exact use of various tools and materials. E. C. Schiele, the genial head of their educational department, was present, greeting old friends and making new ones.

(*Continued on p. XII.*)



When a carpenter buys a saw here's the way he tests it:

He sights along the edge to see if the teeth are even and uniform, and the blade properly breasted.

He bends the blade to see that it is neither too stiff nor too limber.

Does it "hang" right? Does the blade balance, and is the handle properly placed?

Buy *your* saw that way. It's only a waste of money buying a cheap one. Ask for a

Simonds Saw

[Pronounced Si-monds]

and you'll get what a carpenter wants in a saw.

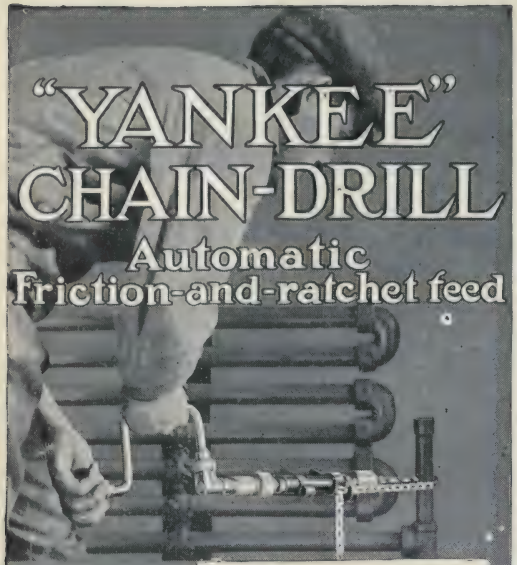
You'll get steel that is tough and hard—Simonds Steel—made by our special process so that the teeth hold their sharp, quick-cutting points for many years with ordinary use. Our accurate taper grinding prevents binding in the cut.

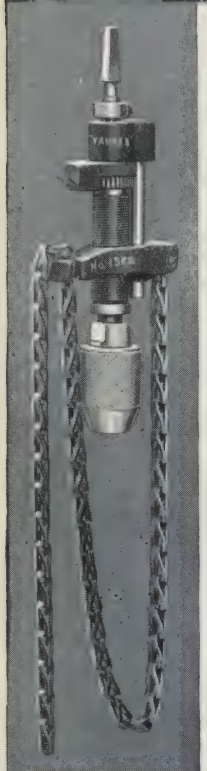
Ask the man who owns a Simonds—or ask your hardware dealer.

It's important to know how to care for a saw. Our free book "THE CARPENTERS GUIDE" tells how. Send for it.

SIMONDS MFG. CO. (Founded 1832) Fitchburg, Mass.

Chicago New Orleans Portland Montreal New York Lockport, N. Y. San Francisco Seattle





THE "YANKEE" Chain Drill is the only chain drill with Automatic Friction and Ratchet Feed.

The "YANKEE" won't break your drill points. The *automatic ratchet feed* keeps an even, steady pressure on the cutting point all through the job. The "YANKEE" is quickly and easily adjusted,—by a few turns of the brace, the *automatic friction feed* tightens the chain and starts the drill with least effort.

Just one movement of a little lever from upright to horizontal accomplishes this change from the friction to the ratchet feed. No complicated parts to handle, nothing to do but turn the brace and change the lever position.

"YANKEE"
Chain Drill No. 1500
Automatic
friction-and-ratchet feed

Ingeniously constructed and as carefully made as every "YANKEE" Tool. Three-jaw chuck. Jaws of tool steel. Holds round shank drills to ½ inch diameter. Square-thread steel feed screw insures durability. Made also with two-jaw chuck.

"YANKEE" Chain Drill 9¾ in. long, 3¼ lbs. weight.

Price $3.25

Your dealer can supply you

Write for "'Yankee' Tool Book"—free—showing styles of Yankee Ratchet, Breast, Hand Drills and other "Yankee" Tools.

NORTH BROS. MFG. CO., Philadelphia

"YANKEE" TOOLS
Make Better Mechanics

TRADE NOTES.

(*Continued from p. XI.*)

Another firm that keeps close to the schools and their interests is the Stanley Rule & Level Co., New Britain, Conn. E. A. Cherry, who was in charge of their exhibit, is a tool expert and his services are coming to be greatly appreciated by those in the market for woodworking tools. He is glad to receive suggestions as well as to give them. He is ever alert for suggestions from teachers that will enable him to improve his tools for school use. Classroom pictures of the tools generally used in woodworking shops were displayed. They measured 16 in. by 13 in. and will be forwarded to any one interested.

An interesting feature of the Simonds Mfg. Co. exhibit was a series of 72 stereopticon pictures in an autoprojector, showing various steps in the manufacture of saws. A series of blueprints showing various technical features of the construction of a hand saw proved very interesting to visitors. R. D. Baldwin, who was in charge of the exhibit, is well known to the school trade. Mr. Baldwin reports that "The Professor and the Saw" continues to be in demand. Any of our readers who are not acquainted with this little pamphlet will find it an interesting story. As an appendix, it contains a description and a working drawing of several kinds of boats.

The rapid development of printing as a school subject made the exhibits of printing equipment centers of attraction. The American Type Founders Co. had a model vocational school printing equipment in operation by pupils of the Grand Rapids high schools. They issued a daily paper called "The Printing Educator." It contained mostly items of news concerning the meeting of the International Association of Teachers of Printing which was held as a departmental meeting of the Convention. F. K. Phillios, superintendent of the educational department, Jersey City, N. J., Henry Lapp, Chicago representative, and John Olney, Grand Rapids representative, were in charge of the exhibit.

W. H. French, representing Barnhart Brothers & Spindler, Chicago, also showed a complete practical school equipment which included a Tracy cabinet, Boston stapler, Chandler & Price

(*Continued on p. XIII.*)

TRADE NOTES.

(*Continued from p. XII.*)

quarto medium press, a single stand, steel galley cabinet, imposing stone and frame, lever paper cutter, and a general line of tools required in printing.

Orr & Locket Hardware Co. specialized in domestic science equipment in their exhibit, showing a complete outfit in children's size. Attention was directed to their domestic science table with white enameled steel top. This firm is well known as dealers in all kinds of manual training and domestic science equipment. Their "Red Book" is familiar to everyone. They are the special representatives of F. E. Wells & Son and the Crescent Machine Co. C. P. Periolat was in charge.

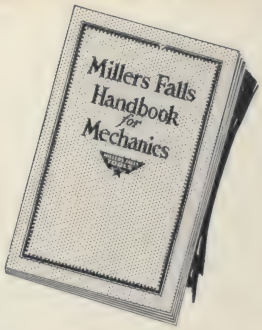
In the exhibit of the Columbia School Supply Co. was shown their new adjustable school seat which can be moved about to suit conveniences. Samples of their sanitary steel school furniture and domestic science tables also were shown. W. A. Moore was in charge.

Everett Frain Co., Chicago, by calling attention to their general catalog, emphasized their ability to furnish schools with all kinds of equipment. In addition to general equipment for woodworking, machine shop and domestic science, they also furnish lumber, fancy cabinet woods and veneers, inlays and cabinet makers hardware.

A complete line of grinding machinery was shown by Wilmarth & Morman Co., Grand Rapids, whose line is known as the "New Yankee." In the use of their grinder no adjustment, other than that of the tail stock for the length of the drill, is necessary. Their Style "BX" has a cylindrical and internal grinding attachment for cutters, reamers, drills, etc., and can be secured in either motor or belt drive, and with or without a point thinning attachment.

To those who have been annoyed over the delays caused by broken or stretched belts, the demonstrations of the "Clipper" belt lacer proved quite convincing. With this lacer the work is done without removing the belt from the shaft,

(*Continued on p. XIV.*)



Send for this Handbook

IT'S FREE

60 pages of mechanical information that has never been compiled before. A mine of the most valuable kind of facts, formulas and helpful hints.

MILLERS FALLS MECHANICS' HANDBOOK

Here are a few subjects:

- Weight per foot of wood
- Wood staining recipes
- Putty, cements and glues for wood
- Number of nails to pound
- How to color steel and brass
- How to figure board measure, shingles, paint, brickwork and stonework

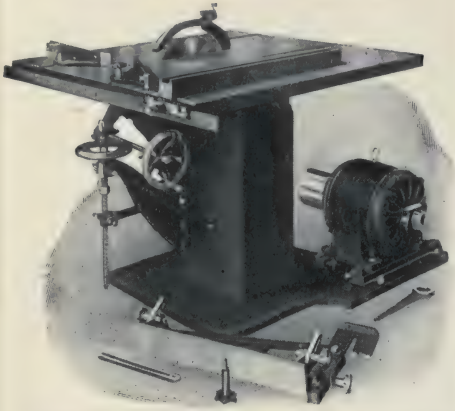
and 50 other subjects.

Send for Book No. 18.

Millers Falls Co.
118 River Street
Millers Falls, Mass.

WE HAVE QUITE A COMPLETE LINE OF

SAW TABLES



Our No. 4 tilting table, with or without motor drive, is up-to-date for manual training. First class in every respect.

Write us.

ALEXANDER DODDS COMPANY
451-453 Monroe Ave., N. W.
Grand Rapids, Mich.

THE WALLACE BENCH PLANER



WITH FLAP AND SHUTTER GUARD

"Your planer has been tested to an extent beyond which it would be difficult to go in the average manual training shop. We are building a five-room bungalow as an advanced manual training project, and have made our own window sashes, casings and all other planer work on THE WALLACE BENCH PLANER. It has stood the strain in handsome fashion, and I am more than pleased with it."—So says F. H. McCrea, Southwestern State Normal School, Weatherford, Okla.

Write for full information.

J. D. WALLACE
521 W. Van Buren St. CHICAGO, ILL.

TRADE NOTES.

(*Continued from p. XIII.*)

and requires not more than five minutes. The lacer is set on the floor or a box, and a row of "Clipper" hooks of the proper width is then placed in the tool. The squared end of the belt to be laced is then inserted, and by depressing the levers the hooks are deeply imbedded into the end of the belt, flush with both surfaces, leaving a uniform row of loops extending across the belt end. When the other end is similarly treated the two ends are brought together around the face of the lower pulley in such a way as to intermesh the loops. A rawhide or fibro pin is slipped through these loops and the work is done. Thus each workman mends his own belt. The Clipper Belt Lacer Company, Grand Rapids, are the manufacturers, and they invite correspondence with all interested. F. Hallman was in charge of their exhibit.

Within the compass of space available, it is difficult to give a comprehensive statement of the service offered by the Electrical School Equipment Co., Milwaukee, represented by H. D. Werwath. First of all, it consists of a practical equipment for teaching electricity, including batteries, switchboards, condensers, annunciators, electro magnets, telegraph instruments, transformers, electric bells, resistance coils, complete lamp banks, etc., so arranged as to afford a course in practical electricity. The whole equipment necessary for a class of 12 pupils working individually at one time, covering tables, switchboards, instruments and supplies, occupies a space of only 6 ft. by 12 ft. This equipment is accompanied by the following three textbooks: Book 1. *First Principles of Electricity*—contains 58 laboratory problems and 88 questions; Book II. *Theory of Direct Current*—Contains 94 laboratory problems and 164 questions; Book III. *Electric Light Wiring*—contains 64 laboratory problems and 27 questions. The course as herein outlined appeals to high schools and continuation schools, and full information will be sent upon request.

At this meeting of the Association A. L. Holcomb & Co., Grand Rapids, represented by F. L. Bouwman, brought their saws to the attention of the school trade for the first time thru the medium of an exhibit. Their narrow band

(*Continued on p. XV.*)

TRADE NOTES.

(*Continued on p. XIV.*)

saw, bevel back scroll saws, setting stake, adjustable dado head, grooving saws, and narrow band saw brazer, are of interest to the school trade, according to their needs.

DRAWING INSTRUMENTS AND SUPPLIES.

The opportunity to meet the teachers who specify drawing room equipment and supplies is eagerly sought, and there is always a goodly representation of dealers in this line.

In the exhibit of Keuffel & Esser, Chicago, emphasis was given to surveying instruments used in connection with the building trades. Teachers are coming to equip their departments with these instruments more and more. They also showed their regular line of drawing instruments, which is very complete. J. J. Carlisle was in charge.

George W. Coffman, representing the United States Bluprint Co., Chicago, called attention to their waterproof drawing ink and their "Nigra" drawing pencil.

The name of the Frederick Post Co., Chicago, suggests the name of Fred Bishop, their well known representative, who made a point of meeting all of his old friends. This firm's line of goods consists of drafting equipment, inks, and various print papers.

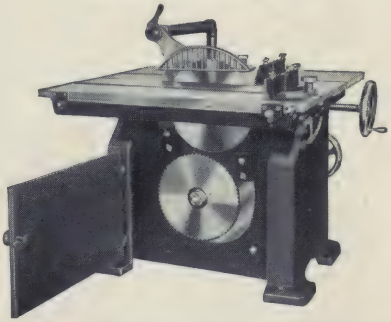
ART MATERIALS.

There were more dealers in art materials represented this year than ever before. The various mediums used in art work were exhibited, and along with them were examples illustrating the character of work which could be done with each medium.

The Prang Company exhibit is always interesting and inviting and one usually finds something new in it. This year their exhibit was made attractive by two sets of colored lithographic prints, one illustrating scenes from "Hiawatha" and the other scenes from "Robinson Crusoe." They are printed in color on toned

(*Continued on p. XVIII.*)

PROTECT
THE BOYS



This machine affords complete protection employing guards of practical design over all moving parts. This is but one phase of the completeness of this universal saw bench. Get our bulletin and prices before you buy.

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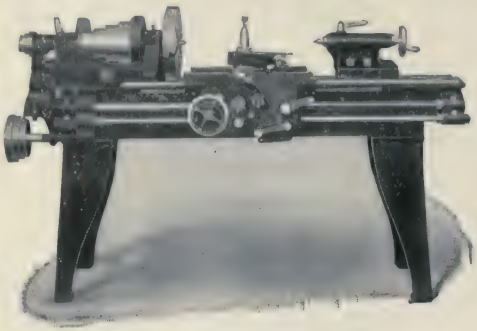
Free to Students

"Saw Points"

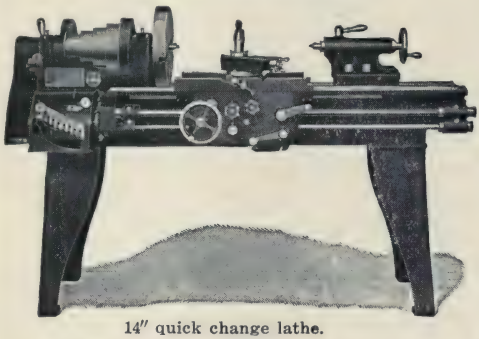
A booklet on how to sharpen and properly set Saws of all kinds. There is one *right* way to do this. Why not know how by reading this booklet. Write for FREE BOOKLET containing information valuable to all students.



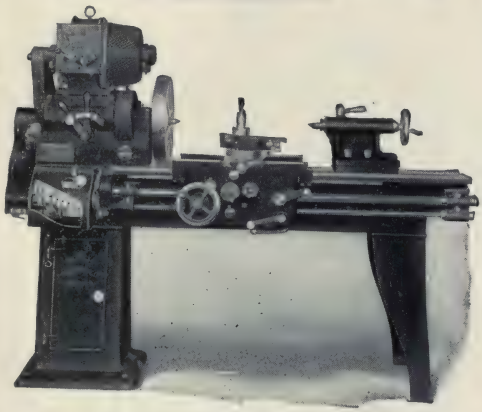
Chas. Morrill
98 Lafayette St., New York



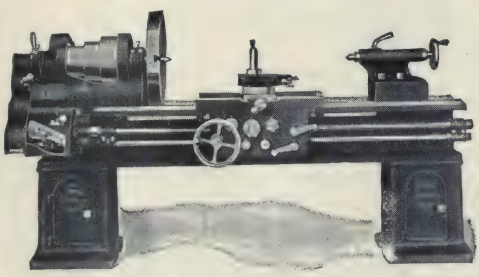
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14″ quick change lathe.



16″ Motor driven geared head.



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from 14 to 20 inch swing

offers the ideal lathe for the manual training school. They are furnished in any style and with practically all attachments desired.

MONARCH lathes are low in price yet are as accurate as the highest priced lathes. By installing MONARCH lathes you can in many instances put in **two** monarch lathes for the same cost as **one** of the high priced lathes.

MONARCH lathes are in use in many factories and tool rooms with lathes costing almost twice as much doing just as much and as accurate work.

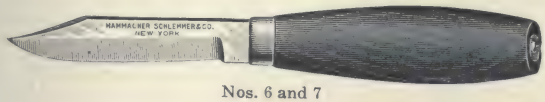
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Let us send you our catalog and list of manual training schools using the Low Priced MONARCH lathes.

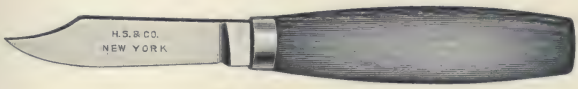
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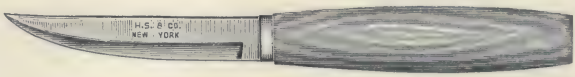
Nos. 6 and 7



No. 7A



No. 8



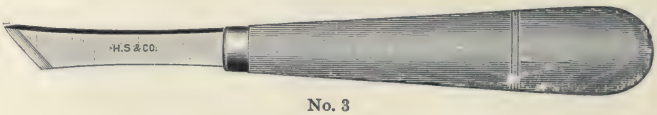
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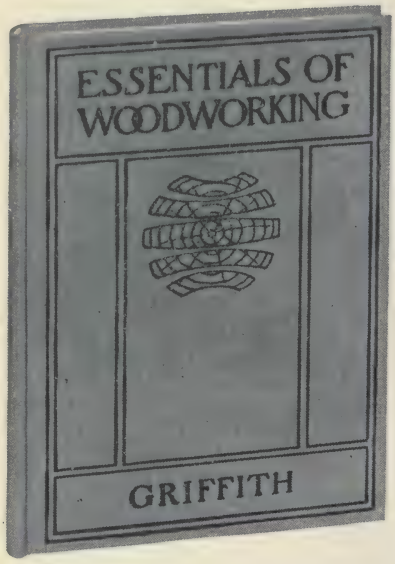
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Discount in quantities.

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PEORIA - - - - - ILLINOIS

TRADE NOTES.

(*Continued from p. XV.*)

stock and are ideal for school room decoration. There is a distinct revival of interest in shadow pictures, and a set of Hiawatha silhouettes have been published by this company. They are also offering a series of ten silhouettes by the famous Dieffenbach, now issued for the first time in this country. The recently published "Industrial Art Text Books" were also quite the center of attraction. E. O. Grover, C. W. Knouff, E. B. Heiney, S. R. Keates, J. D. Fletcher, C. A. Richey and J. M. McElhaney were in attendance from time to time.

One of the interesting things shown in the Thomas Charles Co. exhibit was the Straight Line Picture Cut-Outs illustrating scenes from "Alice in Wonderland." These come in sections which are to be cut out and joined together at dots with tiny fasteners, and then colored with water colors or wax crayons. Their line of water colors and elementary handwork supplies are well known to everyone. Special attention was called to their Economic Pressed Crayons, which are of two kinds, wax and hydro-pressed. They are put up in a metal box with hinged cover that opens easily and closes tightly. The box may be refilled at any time with new crayons bought in bulk at a much lower price than by box. In fact, as one color is exhausted a new supply of that color may be purchased, thus keeping the set complete all the while without buying an entire new assortment. W. H. Matheney, H. W. Nott, E. H. Elwood, H. J. MacNeil and George Cappeler were in attendance.

The American Crayon Co. exihibited a full line of their various crayons, emphasizing especially their Pastello and Crayograph. This firm is quite happy over the two gold medals which were awarded them at the Panama Expostion. One medal was for the quality of their crayon, and the other for their exhibit of crayon art. Miss Florence E. Ellis, W. G. Youse, Lynn B. Curtis, Worth W. Curtis and Leland Spore were in charge of the exhibit.

Binney & Smith, with S. V. Smith in charge, had an exhibit of "Crayola," pastel crayons, and

(*Continued on p. XX.*)



This bench is admirably fitted for sectional classes.

Is Kewaunee Above the Market?

We are told occasionally that we build Kewaunee Manual Training Furniture *above the market*—that the thoroughness of workmanship, high grade of material and unusual finish that distinguish the Kewaunee product are not yet demanded by Schools—that Instructors will be satisfied and Students accomplish as much with cheaper equipment.

This is a superficial opinion to which no true educator will subscribe.

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We should like to correspond with School Executives planning new Manual Training Equipment.

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"Visitors to the N. E. A. Convention will be welcomed at our New York Office, Educational Building, 70 Fifth Ave., where a good representative sample line of our furniture can be seen.

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A Third of a College Year's Work can be obtained this summer at Peabody College. Besides the regular academic subjects and special courses for the training of teachers there will be given the following courses in Manual Training and related subjects.

Manual Training. Handwork for Primary Grades, Handwork for Intermediate Grades, Woodworking for Rural Schools, Elementary and Advanced Woodworking, House Planning, Construction and Decoration, Teaching of Manual Training.

Mechanical Drawing. Mechanical Drawing, Machine Drawing, Architectural Drawing.

Drawing and Design. House Furnishing and Decoration, Public School Drawing, Blackboard Drawing, High School Drawing, Applied Design, Public School Drawing and its Supervision.

The **Summer Quarter** is composed of two terms: the first extends from June 15 to July 21, the second term from July 22 to August 25. Degrees of B. S., M. A., and Ph. D. Write for catalogue.

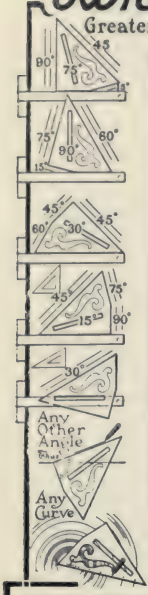
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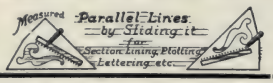
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TRADE NOTES.

(*Continued from p. XVIII.*)

"Boston" pressed crayons, together with examples of work done with these materials. Their school crayons were awarded the medal of honor at the Panama Exposition.

In the Favor, Ruhl & Co. exhibit, C. W. Bidwell and Arthur A. Olson emphasibed the growing popularity of the Munsell Color System. They had in their exhibit the Munsell opaque water colors in liquid form for poster work, and Gee-Wee tempera colors manufactured by Gunter, Wagner & Co.

The chief items of interest in the Joseph Dixon Crucible Co. exhibit were their white pencils for blueprints, photo albums, victrola albums, etc., and their "Eldorado" pencil. Other items included crayons, erasers, and a large variety of lead pencils. Horace M. Johnson, Chicago manager, H. A. Van Derslice, St. Louis manager, and C. M. Harding, Canton, Pa., were in attendance.

Devoe & Reynolds Co., with E. D. St. John and S. R. Griffiths in charge, were showing 24 poster and show card colors in liquid form in 2 oz. jars. Their tempera water colors have a patent steel clip at the end of the tube which tends to keep the air out and keeps the color moist.

A firm that exhibited for the first time at the meeting of the Association was A. H. Abbott & Co. This firm has always been looked upon as catering to the studio trade almost exclusively. Some recent changes in the management, however, have caused them to become interested in the school trade. In addition to water colors and all kinds of artist supplies, they called special attention to their prepared modeling clay to which they have given the name "La Plastique."

WOOD FINISHES.

No firm is better known in the wood finishing field than S. C. Johnson & Son. They had two exhibit spaces, using one for a display of their goods and the other for a rest room for visitors. The rest room was attractively furnished with

(*Continued on p. XXII.*)

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Don't put off buying Your MANUAL TRAINING TOOLS. **NOW IS THE TIME** to send in your order if you want to be sure to have your machines ready for business the first day of the Fall Semester.

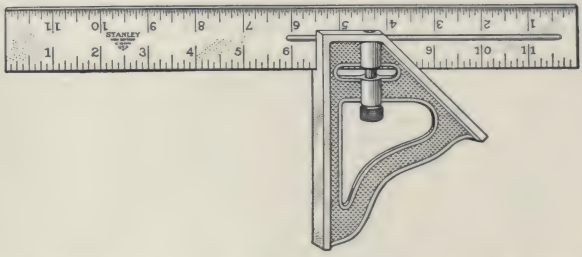
Send us a list of your requirements, specifying electrical characteristics, so that we may quote prices with complete details.

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Stanley Tools



Stanley Adjustable Try and Mitre Square No. 21

Another important addition to the long line of STANLEY TOOLS especially adapted for Manual Training use.

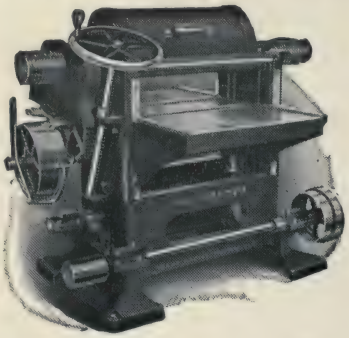
The *Blade* is adjustable and as it can be reversed, provides any size of try or mitre square within the capacity of the tool. In reversing, it is not necessary to remove the blade from the handle, consequently the tool is always assembled and ready for use.

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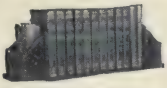
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THE MANUAL ARTS PRESS PEORIA, ILL.

TRADE NOTES.

(*Continued from p. XX.*)

comfortable rockers, and the reading table was covered with the latest magazines and the morning and evening papers. This thoughtful provision for the comfort of visitors and friends was greatly appreciated. A new line of oil stains were being shown by P. Petersen, who was in charge. Very satisfactory reports are being received from those who have used the new stains and the firm invites correspondence from those unacquainted with them.

John Lucas & Co. Inc., well known manufacturers of paint and varnish, have come into the school field with several kinds of wood finishes having a soft finish. Their "Abbey" stains produce mission finishes, and their "Velvo-tone" finish stains, varnishes, and produces a rubbed effect with one operation. They distributed a beautiful booklet entitled "The Art of Interior Decoration." M. H. Hughes was their representative.

SCHOOL ROOM DECORATION.

More and more the subject of school room decoration is receiving the attention that it deserves. One of the best known firms in this field is the Elson Art Publication Co. Inc., Belmont, Mass. For the purpose of developing art appreciation thru picture study the Elson Miniatures are meeting a recognized need. They are inexpensive, and yet are of perfect execution, and cover painting, sculpture and architecture. Thru their free loan of exhibits they assist schools in securing appropriate school room decoration. Particulars will be gladly furnished. George B. Heath, their Chicago representative, was in charge.

PUBLISHERS.

If the publishing interests were not represented at these conventions, visitors would indeed miss a great opportunity. It is the one time when teachers can make the acquaintance of the latest books and learn about forthcoming books. This was especially true of the large exhibit made by The Manual Arts Press. Their new book "Art in Dress," by Misses Bolmar and McNutt was

(*Continued on p. XXII.*)

PRINTING EQUIPMENT

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PRESSES—Hand lever, foot power, steam and electric power. Safe, simple, convenient and the most efficient. Prices $10 to $600.

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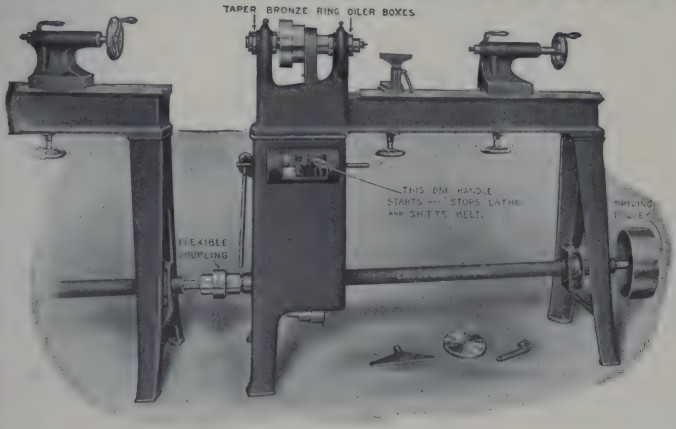
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SAFETY AND SIMPLICITY—

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has no equal in those and other essential features. We welcome investigation and comparison.

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Single Handle Control on both Shaft Underdrive and Motor Underdrive Lathes.

Demonstrator's Lathes with either Outside Face Plate, Tripod and Tee Rest or Hand Feed Carriage or both.

Every Manual Training Supervisor and Instructor should send for our New Free Circular.

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Dietzgen Instruments

—the proper aids for correct drawings—
are quality instruments in quality cases—
the perfect combination.



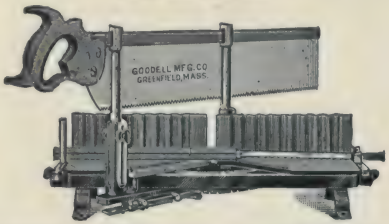
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Thief River Falls, Minnesota, is a fine big thriving town despite its name. Kenneth O. Latta, age 12, lives there. He has a beautiful smile because after sticking type "from his youth up" he has become the champion speller of Marshall County. He "spelled down" all comers achieving a percentage of 99 2-3 against the best talent in the district. Printing is a marvelous teacher; what it teaches is retained. Every school needs a printing plant. We supply such plants. Send for details and estimates.

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EVERYTHING FOR MANUAL TRAINING SHOP OR SCHOOL KITCHEN
3940 Wabash Ave. CHICAGO

"AT YOUR SERVICE"

TRADE NOTES.

(*Continued from p. XXII.*)

off the press just in time to be shown at this convention. "Bird Houses Boys Can Build," and the second series of "Shop Problems" tracings, both by Siepert, and "Problems in Farm Woodwork," by Blackburn, were given prominence. L. L. Simpson was in charge of the display.

A. G. Fenney, of the A. G. Fenney Company, Providence, R. I., was showing exceptionally fine sets of foreign poster and design folios. These collections represent a very careful selection of the best works of European artists presented in photographic loose leaf form, making them especially available for students. The entire art field is well covered in the selections offered. One series is devoted to decorative and poster motifs, another to the special field of advertising posters. The folio in figure composition is unusually fine, the selections having been made from the works of Alphonso Mucha. Life studies from La Lyre and animal studies from M. Mihent represent two more folios of the series. Fragments in drawing and composition selected from thirty of the best German story books combine to make another set of plates. The more modern motifs suggestive for leather, jewelry and embroidery have also found a place in this unique series. The commercial artist especially will find the collections representing studies in facial expression and practical poses of the hands of value. The entire series of plates are designed to be of the greatest practical use to the student, not only in furnishing ideas and giving suggestions in composition and technic, but they will also further an appreciation of the very best that has been done in these particular fields of artistic expression.

Among the publishers making interesting announcements was Atkinson, Mentzer & Co., their latest book being "Costume Design and Home Planning" by Estelle P. Izor. Their booth was decorated with illustrations from the book. It is a high school text on a very timely subject. C. J. Hoebeke and W. R. Norris were in attendance.

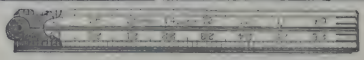
Another timely book is "A Course in House Planning and Furnishing," by Charlotte Cal-

(*Continued on p. XXVI.*)

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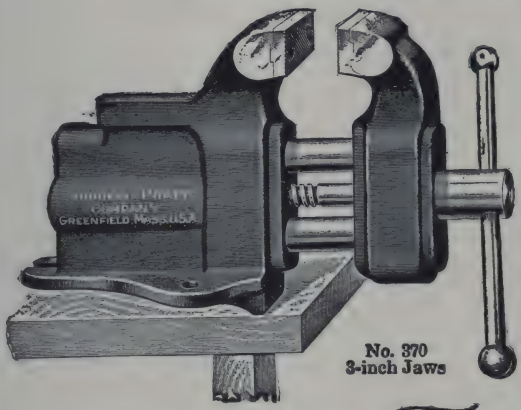
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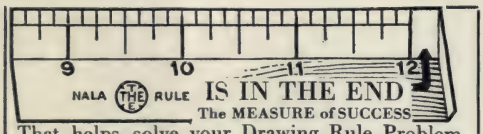
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TRADE NOTES.

(*Continued from p. XXIV.*)

kins, just published by Scott Foresman & Co. It has been planned especially for junior high school students. Their walls were decorated with examples of school work which followed that outlined in "The New Educational Course in Constructive Design." J. A. Stevenson was in charge of the exhibit.

The Practical Drawing Co., Dallas, Texas, announce for future publication a new set of drawing books entitled "Modern Arts," by G. W. Ware, which will show the relation between art and the home. This firm have already published sets of drawing books. Mrs. J. B. Campbell, St. Louis, and C. E. Avis, Chicago, were in attendance.

The Industrial Book and Equipment Co., Indianapolis, make a specialty of textbooks and planned courses for all industrial subjects, and the necessary equipment and supplies for carrying out the work. Guy M. Jones was in charge of their exhibit.



A semi-steel anvil has been found to meet the necessary requirements for manual training, and the above is an illustration of the one which the Buffalo Forge Co. have recently put on the market. It is cast from the first pour of the cupola, which contains a considerable amount of steel. The face is chilled and ground and the anvil is well proportioned. It has been subjected to a severe test and has proved its claims.

The teaching ability of E. C. Achiele, director of the educational department of Henry Disston & Son, was amply demonstrated a few weeks ago when he gave an entertaining, as well as thoroly instructive illustrated lecture before the

(*Continued on p. XXVIII.*)



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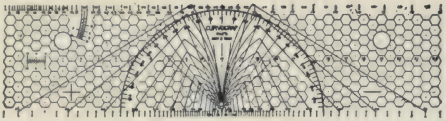
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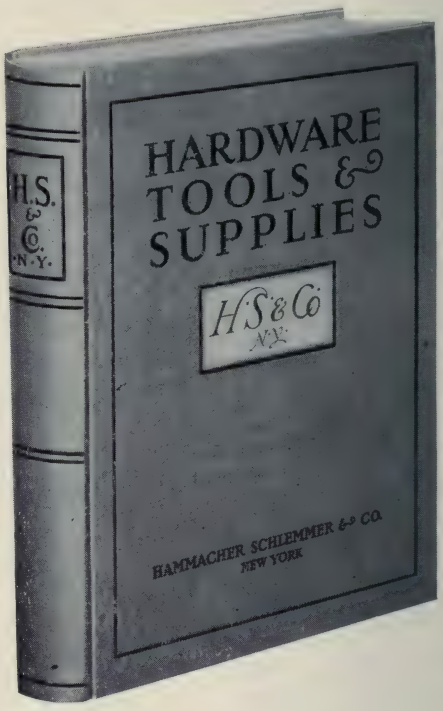
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TRADE NOTES.

(*Continued from p. XXVI.*)

students of Bradley Polytechnic Institute. His familiarity with the history of saw manufacture as well as saw use gives him unusual power to answer the practical questions which students are ready to ask.



The above illustration falls far short of giving an adequate idea of the comprehensiveness of the new catalog which Hammacher, Schlemmer & Co. have recently issued. It measures 9½x12½ inches and contains 1142 pages, 30 pages of which are required for the index. The make-up shows careful thought, and the printing and binding are examples of the best workmanship. Not a single item in their entire line has been overlooked. To produce such a catalog calls for an expenditure of thousands of dollars, and this necessitates judicious distribution. However, they will be glad to send a copy to directors of manual training whose specifications for the coming year will be sufficient to justify it. This is only a fair protection when it is known that each copy has cost the firm a little over four dollars.





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A text-book in elementary forging for apprentices and high school students, with advanced forging, tool-making, and art forging exercises for evening classes. The author is himself a smith of extended training and well-known reputation.

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DRAWING FOR BUILDERS

By R. BURDETTE DALE, B. M. E., M. E., Assistant Professor in Charge of Vocational Courses in Engineering and Correspondence Instruction, Iowa State College.

A book for use in the study of elementary architectural drawing in schools. Comprises a problem course in drawing for carpenters, woodworkers, builders and architects' draftsmen.

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BOOK NOTES

During the summer months the Manual Arts Press expects to publish the three books announced several months ago in these columns.

It is expected that the first of these to appear will be the problem book and shop manual, *An Elementary Course in Electrical Construction,* by Walter B. Weber, of the Seneca Vocational School, Buffalo, N. Y. This will be a remarkably practical book by a practical workman and teacher. It is now expected that this will be off the press early in June.

The next of the three books will be *Woodwork for Secondary Schools,* by Professor Ira S. Griffith, of the University of Missouri. This is a book upon which a very great amount of effort has been spent to make it a textbook of the highest quality. It contains a large amount of material not heretofore available in textbook form.

Later in the summer the book on *Carpentry* by Professor Griffith will appear. The delay in this, as in the book just mentioned, has been due to the large amount of time required to produce the drawings for the numerous illustrations. This book is a remarkably clear and complete treatise, and it is written from the instruction point of view.

In addition to these three books the Manual Arts Press expects to issue before the first of July a unique work entitled *Demonstrations in Woodwork,* by Professor Clinton S. Van Deusen, head of the Department of Manual Arts of the State Normal College at Kent, Ohio. This is intended especially for rural schools, tho it is likely to meet the needs in any city school where children in small groups, or individually, are thrown largely upon their own responsibility, receiving comparatively little attention from the teacher. Each demonstration is on a four-page folder and is complete in itself. These folders are punched to fit a binder. Eight different demonstrations or folders will be sold in a set. Three sets will be issued this summer. The price of each set will be 25 cents. Already the problems of these demonstrations have been tried out and found very successful in the rural schools of Portage County, Ohio.

Early in June the Manual Arts Press expects to issue a third series of *Shop Problems* in tracing form, edited by Albert F. Siepert. The first series was published on June 17, 1915, the second on March 3, 1916. The tracings have proven popular because of the price, 25 cents a series, which is so low, because of the quality of the designs, and because by their use a teacher can make his own blueprints without taking the time to make tracings.

The following letter was received on May 12 from Miss Ella V. Dobbs, assistant professor of manual arts, at the University of Missouri

"A few days ago I received a copy of your new little book *Art in Dress.* I enjoyed the chapters that were published in the magazine and the book is a timely contribution to a great need. I am enclosing a check for twenty copies which I shall use in my classes. This is the best way I can express my approval of the book."

This letter was so much appreciated that we asked permission to publish it.

Bird Houses Boys Can Build, by Siepert, has been favorably reviewed by quite a number of newspapers in all parts of this country, also in Canada. The Toronto Weekly Star speaks of it as "a bright contribution to the rapidly increasing literature of conservation. Just as the camera has replaced the rifle in the study of nature, so the boy who used to find his amusement in robbing birds' nests will seek it now in attracting the birds to his own backyard or window, providing a commodious home for them and studying their habits at close range."

We have heard so much lately about home decoration and now comes "*Landscape Gardening as Applied to Home Decoration,*" by Samuel T. Maynard, published by John Wiley & Sons. It was originally published several years ago, but has just been revised and enlarged. In this book the home-maker can find in convenient form information about making his lawn and grounds attractive. It tells in pleasing and simple terms about preparing the land; about the lawn, how to seed, care for and renew, etc.; about trees, shrubbery, flowers and the home grown garden. The great progress made in the last few years in out of doors house decoration is all presented, together with little touches of information about the common things which the home-maker wants to know.

BIRD HOUSES BOYS CAN BUILD



By ALBERT F. SIEPERT

Bradley Polytechnic Institute, Peoria, Illinois

A BOOK of rare interest to boys who are lovers of nature, the out-of-doors, and especially "our feathered friends", the birds. It illustrates hundreds of bird houses and shows working drawings of houses of various designs, some formal, some rustic, and some of cement. Bird houses, feeders, shelters, sparrow traps, and other bird accessories, are also illustrated by photographs and drawings. The common house-nesting birds such as wrens, bluebirds, house finches, martins and others are pictured and described, together with information regarding foods, houses and shelters suitable for each. Excellent illustrations give a good idea of the character and size of successful bird house exhibitions which have been conducted in several cities. It is written in the boy spirit and combines the charm of nature with the allurements of continuation work in wood.

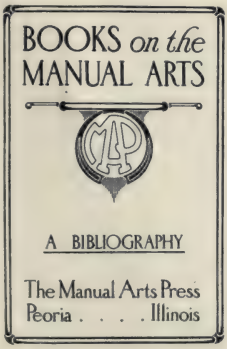
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A handbook for teachers and a textbook for normal school and college students. The best reference book available for teachers of woodworking. $2.00.

WOOD AND FOREST. By William Noyes.
Treats of wood, distribution of American forests, life of the forest, enemies of the forest, destruction, conservation and uses of the forest, with a key to the common woods by Filibert Roth. Describes 67 principal species of wood. $3.00.

MANUAL ARTS FOR VOCATIONAL ENDS. By Fred D. Crawshaw.
A strong and convincing plea for the development of the present school machinery to serve the ends of vocational education. $.85.

HANDWORK INSTRUCTION FOR BOYS. By Dr. Alwin Pabst.
A philosophical and historical review of manual training for boys by the director of the normal school for teachers of manual training at Leipsic. $1.00.

HANDCRAFT IN WOOD AND METAL. By J. Hooper and A. J. Shirley.
A valuable reference book. It treats of historic craftwork, materials used in handcrafts, designing, decorative processes, the historic development of tools. $3.

CORRELATED COURSES IN WOODWORK AND MECHANICAL DRAWING. By Ira S. Griffith.
This book meets the everyday need of the teacher of woodworking and mechanical drawing for reliable information concerning organization of courses, subject matter, and methods of teaching. $1.50.

FURNITURE DESIGN FOR SCHOOLS AND SHOPS. By Fred D. Crawshaw.
A manual on furniture design. It contains a collection of plates showing perspective drawings of typical designs, representing particular types of furniture. A practical and helpful book that should be in the hands of every teacher of cabinet making and designing. $1.00.

MANUAL TRAINING TOYS FOR THE BOYS' WORKSHOP. By H. W. Moore.
A popular boys' book that is truly educational. The book contains 35 full-page plates of working drawings illustrating 42 projects accompanied by directions for making. $1.00.

KITECRAFT AND KITE TOURNAMENTS. By Charles M. Miller.
It deals with the construction and flying of all kinds of kites, and the making and using of kite accessories. Also aeroplanes, gliders, propellers, motors, etc. Authoritative. $1.00.

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PAPER AND CARDBOARD CONSTRUCTION. By G. F. Buxton and F. L. Curran.
A handbook for teachers covering book problems, box problems, card problems and envelope problems for the first four grades. It outlines courses, gives detailed working directions, and suggestions concerning equipment, supplies and methods of teaching. $1.50.

LEATHER WORK. By Adelaide Mickel.
A manual on art leather work for students, teachers and craft workers. It gives detailed descriptions of the various processes of working, treating of flat modeling, embossing or repoussé, carved leather and cut work. $.75.

CLAY WORK. By Katherine M. Lester.
This book was written by a grade teacher and art worker to help teachers in acquiring the technique of clay working, and to give them suggestions concerning the teaching of the several types of clay work suited to pupils in the elementary schools. $1.00.

HANDICRAFT FOR GIRLS. By Idabelle McGlauflin.
A handbook for teachers, detailing a five-years' course in sewing for girls in the public schools. Chapters on stitches, fibres and fabrics, cloth and cardboard construction, basketry, dress in its relation to art, and home furnishing. $1.00.

ART METALWORK. By Arthur F. Payne.
A textbook written by an expert craftsman and experienced teacher. It treats of the various materials and their production, ores, alloys, commercial forms, etc.; of tools and equipments suitable for the work, and of the correlation of art metalwork with design and other school subjects. $1.50.

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AFTER HOURS

THE RECOMMENDATION SEASON.

FOR men in school administrative positions, and especially in normal schools, spring is no longer the time of flowers and long walks and baseball so much as it is the season for writing recommendations. One gets to know the agency requests as far as he can see them, and often his replies get to be almost as stereotyped as the blanks suggesting the kinds of information desired.

Sometimes it is a real pleasure to write letters of recommendation. It is like introducing two friends whom you are sure will enjoy each other's company. At other times it is more like solving an equation in which one or both of the conditions of the problem are most easily expressed in terms of radicals and imaginary quantities.

The other day my friend Brangton, whose higher mathematics is still a potent factor in his daily life, in writing a letter of recommendation made use of his technical vocabulary to good effect. In comparing Mr. A. and Mr. B. he said that both were good men and good workmen; that Mr. A. was exceptionally good, but that his coefficient of fiction was greater than that of Mr. B.

One of the most disheartening things about writing recommendations is to have your statements discounted by the man who receives them. The ideal situation exists only when the man written to takes your statements for face value, and you tell the unvarnished truth. But such ideal conditions do not always exist. They seldom exist in the case of general recommendations because it has come to be the custom in many quarters to discount such recommendations, and then allow a factor for safety. The other day I wrote an enthusiastic recommendation about a very superior young man. I had never before heard of the superintendent to whom I wrote the letter, nor had he ever heard of me, so far as I know. The recommendation seemed to have no effect. I began to think I had been too frank and hearty in my statements. So I asked a mutual friend to call on this unknown superintendent and tell him that I was not a liar and that he would be safe in taking my statement at face value. The young man received his appointment immediately.

But frank statements, if adverse, are not always treated as well as complimentary statements. A superintendent asked me for a confidental statement about a man who was not especially strong in his qualifications. After a few weeks he appointed another man, and then sent my confidential letter to the young man, who, in turn, proceeded to cross-examine me. I think it proved to be a good lesson for the young man seeking the position, but I think I was justified in consigning the superintendent at once to my mental black list. On this same list is the man who asked me to recommend a $1,000 man and then offered him $850. Fortunately the young man was offered $1,000 that same day, and he accepted it.

There are times when one feels like following the example of the clergyman who had an Irish girl working in his home. She had such a bad temper that she became intolerable, and he and his good wife decided to send her away. Before going, however, the girl asked him for a recommendation. Not wishing to send a poor girl out into the world without something to help her, yet feeling the necessity of adhering strictly to the truth he wrote, "This is to introduce Miss Anne O'Leary. If anybody wants just such a girl as she is, they cannot do any better than to take her."

UNSATISFIED.

I have not yet fully recovered from the effect of one of those fine darky stories told by Dr. Prosser at the banquet in Grand Rapids. It is too bad for me to try to tell it, but it's too good to keep. Shorn of his art in the telling and the darky dialect, it is something like this

There lived in the Sunny Southland a pious darky mammy who planted cabbages near her cabin. After days and days of dry weather the cabbages were in grave danger of burning up from the heat of the sun. So she prayed to the Lord to send rain upon her cabbages. Night after night she repeated the prayer until finally the thunder and lightning announced the coming of rain. Then it began to pour; the rain fell in sheets; the whole place was flooded, and the cabbages were in danger of being washed away. So the old mammy went back to her bedside and prayed: "O Lord, we did pray for rain, but this is simply ridiculous."